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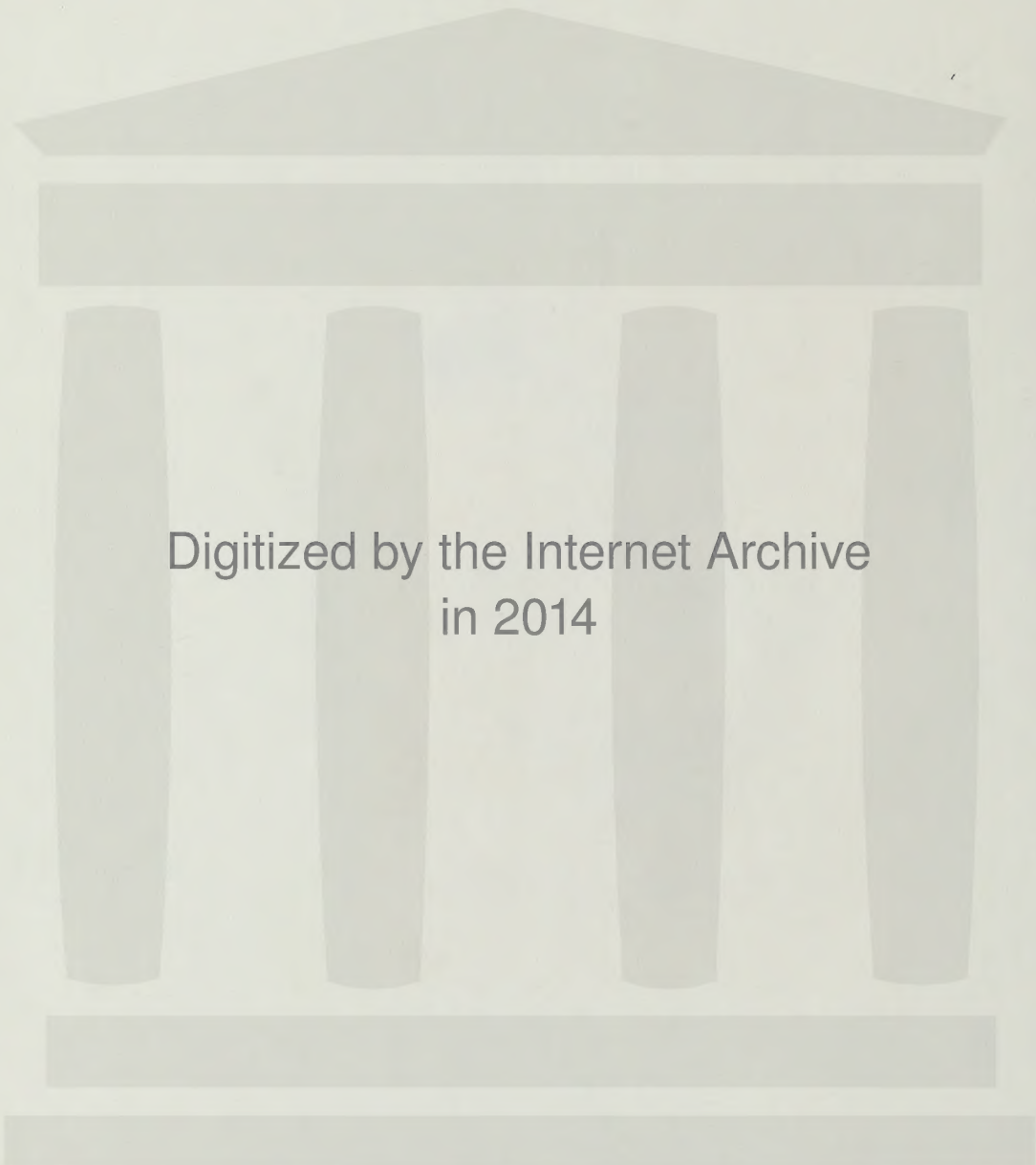

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PLANNING DEPARTMENT

SAN FRANCISCO REDEVELOPMENT AGENCY

SAN FRANCISCO GIANTS BALLPARK AT CHINA BASIN

Final Environmental Impact Report

Volume I

96.176E

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SAN FRANCISCO GIANTS BALLPARK AT CHINA BASIN

Final Environmental Impact Report

96.176E

Volume I

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SAN FRANCISCO GIANTS BALLPARK
AT CHINA BASIN

FINAL ENVIRONMENTAL IMPACT REPORT

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SAN FRANCISCO GIANTS BALLPARK AT CHINA BASIN

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RESOLUTION NO. 96-97
(Adopted June 26, 1997)

ADOPTING FINDINGS RELATED TO THE CERTIFICATION OF A FINAL ENVIRONMENTAL IMPACT REPORT FOR A PROPOSED 42,000 SEAT BALLPARK, INCLUDING RELATED FACILITIES, RETAIL/COMMERCIAL SPACE, OTHER ASSEMBLY USES AND PARKING, LOCATED IN THE AREA BOUNDED BY SECOND, THIRD AND KING STREETS AND CHINA BASIN CHANNEL

BASIS OF RESOLUTION

1. The City and County of San Francisco, acting through the San Francisco Redevelopment Agency (the "Agency") and the Planning Department (the "Department"), together acting as co-lead agencies for conducting this environmental review, fulfilled all procedural, format and content requirements of the California Environmental Quality Act (Cal. Pub. Res. Code Section 21000 *et seq.* ("CEQA")), the State CEQA Guidelines (Cal. Admin. Code Title 14, Section 15000 *et seq.* ("CEQA Guidelines")), Chapter 31 of the San Francisco Administrative Code (hereinafter "Chapter 31"), and the Agency's Resolution No. 59-77, adopted March 8, 1977 (the "Resolution"), to wit:

a. The Agency and the Department determined that an environmental impact report was required and provided public notice of that determination by publication in a newspaper of general circulation on October 11, 1996.

b. On March 14, 1997, the Department published the Draft Environmental Impact Report (the "DEIR") and provided public notice in a newspaper of general circulation of the availability of the DEIR for public review and comment and of the date and time of the Redevelopment Agency Commission and the City Planning Commission joint public hearing on the DEIR; the notice was mailed to the Agency's list of persons requesting such notice.

c. Notices of availability of the DEIR and of the date and time of the public hearing were posted near the project site by Department staff.

d. On March 14, 1997, copies of the DEIR were mailed or otherwise delivered to a list of persons requesting it, to those noted on the distribution

list in the DEIR, to adjacent property owners, and to government agencies, the latter both directly and through the State Clearinghouse.

e. Notice of Completion was filed with the State Secretary of Resources via the State Clearinghouse on March 14, 1997.

2. The Agency Commission and the Planning Commission held a duly advertised public hearing on said DEIR on April 17, 1997 at which opportunity for public comment was given, public comment was received on the DEIR and the public hearing was closed. The period for acceptance of written comments ended on April 30, 1997.

3. The Agency and the Department prepared responses to comments on environmental issues received at the public hearing and in writing during the 45-day public review period for the DEIR, prepared revisions to the text of the DEIR in response to comments received or based on additional information that became available during the public review period, and corrected errors in the DEIR. This material was presented in a "Draft Summary of Comments and Responses," published on June 16, 1997, was distributed to the Commission and to all persons who commented on the DEIR, and was available to others upon request at Department offices.

4. A Final Environmental Impact Report (the "FEIR") has been prepared by the Agency and the Department, consisting of the DEIR, any consultations and comments received during the review process, any additional information that became available, and the Summary of Comments and Responses, all as required by law.

5. Project Environmental Impact Report files have been made available for review by the Agency Commission, the Planning Commission and the public, and these files are part of the record before the Agency Commission and the Planning Commission.

6 On June 26, 1997, the Agency Commission and the Planning Commission reviewed and considered the FEIR and found that the contents of said report and the procedures through which the FEIR was prepared, publicized and reviewed comply with the provisions of CEQA, the CEQA Guidelines, Chapter 31 and the Resolution.

7. The Project sponsor has indicated that the presently preferred alternative modifies the preferred alternative in the EIR by, among other things, elimination of the ballpark restaurant, a reduction in on-site parking and an increase in public plaza space. As such, the project is a combination of the uses described in the FEIR Project Description and the Reduced Project Alternative.

RESOLUTION

ACCORDINGLY, IT IS HEREBY RESOLVED by the Agency Commission, after consideration, that:

The Agency Commission makes the following findings:

1. The Agency Commission hereby does hereby find that the FEIR concerning File No. 96.176E: reflects the independent judgment of the City and County of San Francisco, is adequate, accurate and objective and that the Summary of Comments and Responses contains no significant revisions to the DEIR, and hereby does CERTIFY THE COMPLETION of said FEIR in compliance with CEQA and the CEQA Guidelines.

2. The Agency Commission in certifying the completion of the FEIR does hereby find that the project described in the EIR and as modified by the Project Sponsor and described above would have the following unavoidable significant impacts:

a. The project would cause extensive queuing to occur on freeway on-ramps after weekday afternoon games and before weekday night games. Queuing would be increased further by cumulative development in the project vicinity. Freeway on-ramps affected by the project include eastbound freeway on-ramps to I-80/Bay Bridge and westbound freeway on-ramps to I-80/U.S. Highway 101 at Fourth Street and Harrison Street. Additional on-ramps affected by the project plus cumulative development include ramps westbound at Harrison and First Streets (to I-80 eastbound) and southbound on Fifth Street (to I-80 eastbound). No specific feasible improvements are available to address the impacts of ballpark traffic on freeways and freeway ramps, except for transit related mitigation measures and travel demand management measures that would reduce but not eliminate the impacts of ballpark traffic on freeway on- and off-ramps.

b. The levels of service ("LOS") for some intersections in the project vicinity would deteriorate to LOS E and F, signifying excessive delay (60 seconds or more) conditions. LOS of D (with delay in the range of 25 to 40 seconds) is the minimum acceptable operating condition for urban San Francisco streets. LOS E and F represent unacceptable operating

conditions. No mitigation measures are available to the project to improve all affected intersections to acceptable levels of service beyond the measures already included in the project.

c. Cumulative impacts on local transit systems include incremental increases and passenger loads on existing MUNI lines, and demand for new shuttle services to the ballpark and other south of Market area destinations.

d. Traffic noise impacts identified in the 2015 UCSF-Mission Bay Cumulative Scenario would cause a substantial increase in traffic noise in the Mariposa/De Haro Street area. The transportation mitigation discussion includes a proposed detour for non-ballpark traffic that would route non-ballpark traffic from Third Street west to Seventh Street between King and Mariposa Streets before and after ball games. At Seventh and Townsend Street, the detoured traffic would increase eight-hour carbon monoxide ("CO") concentrations to about 9.9 ppm, a new violation of eight-hour state and federal CO standards. No other location studied would exceed the standards.

e. Violations of the state one-hour and state/federal eight-hour CO standards are anticipated at almost all of the study receptors in the year 2000. By the year 2015, one-hour and eight-hour CO concentrations would decline at modeled receptors at the study intersections because of increasingly stringent vehicular emission controls expected to be implemented over the next 20 years, and no violations of the state and/or federal CO standards are anticipated. Transportation mitigation measures encouraging regional transit would reduce, but would not completely eliminate, vehicular air pollutant emissions below a level of significance.

f. The FEIR states that nitrogen oxide (NO_x) emissions attributable to the combination of ballpark traffic and traffic associated with other on-site uses in year 2000 of 101 pounds per day (lb/day) and in year 2015 of 82 lb/day would exceed the Bay Area Air Qulaity Management District's project threshold of 80 lb/day. Because the Project does not include the centerfield restaurant, the Project does not exceed the

BAAQMD threshold in the year 2015 and therefore the significant unavoidable NO_x impact for year 2015 and beyond is eliminated.

APPROVED AS TO FORM

David M. Madway
Agency General Counsel

SAN FRANCISCO

CITY PLANNING COMMISSION

MOTION NO. 14398

ADOPTING FINDINGS RELATED TO THE CERTIFICATION OF A FINAL ENVIRONMENTAL IMPACT REPORT FOR A PROPOSED 42,000 SEAT BALLPARK INCLUDING RELATED FACILITIES, RETAIL/ COMMERCIAL SPACE, OTHER ASSEMBLY AND ENTERTAINMENT USES AND PARKING, LOCATED IN THE AREA BOUNDED BY SECOND, THIRD AND KING STREETS AND CHINA BASIN CHANNEL.

MOVED, That the San Francisco City Planning Commission (hereinafter "Commission") hereby CERTIFIES the Final Environmental Impact Report identified as case file No. 96.176E, (hereinafter"Project") based upon the following findings:

1) The City and County of San Francisco, acting through the Department of City Planning (hereinafter"Department") fulfilled all procedural requirements of the California Environmental Quality Act (Cal. Pub. Res. Code Section 21000 et seq., hereinafter "CEQA"), the State CEQA Guidelines (Cal. Admin. Code Title14, Section 15000 et. seq., (hereinafter "CEQA Guidelines") and Chapter 31 of the San Francisco Administrative Code (hereinafter "Chapter 31").

a. The Department determined that an EIR was required and provided public notice of that determination by publication in a newspaper of general circulation on October 11, 1996.

b. On March 14, 1997, the Department published the Draft Environmental Impact Report (hereinafter "DEIR") and provided public notice in a newspaper of general circulation of the availability of the DEIR for public review and comment and of the date and time of the City Planning Commission public hearing on the DEIR; this notice was mailed to the Department's list of persons requesting such notice.

c. Notices of availability of the DEIR and of the date and time of the public hearing were posted near the project site by Department staff.

d. On March 14, 1997, copies of the DEIR were mailed or otherwise delivered to a list of persons requesting it, to those noted on the distribution list in the DEIR, to adjacent property owners, and to government agencies, the latter both directly and through the State Clearinghouse.

e. Notice of Completion was filed with the State Secretary of Resources via the State Clearinghouse on March 14, 1997.

2) The Commission held a duly advertised public hearing on said Draft Environmental Impact Report on April 17, 1997 at which opportunity for public comment was given, public comment was received on the DEIR and the public hearing was closed. The period for acceptance of written comments ended on April 30, 1997.

CITY PLANNING COMMISSION

3) The Department prepared responses to comments on environmental issues received at the public hearing and in writing during the 45-day public review period for the DEIR, prepared revisions to the text of the DEIR in response to comments received or based on additional information that became available during the public review period, and corrected errors in the DEIR. This material was presented in a "Draft Summary of Comments and Responses," published on June 16, 1997, was distributed to the Commission and to all parties who commented on the DEIR, and was available to others upon request at Department offices.

4) A Final Environmental Impact Report has been prepared by the Department, consisting of the Draft Environmental Impact Report, any consultations and comments received during the review process, any additional information that became available, and the Summary of Comments and Responses all as required by law.

5) Project Environmental Impact Report files have been made available for review by the Commission and the public, and these files are part of the record before the Commission.

6) On June 26, 1997, the Commission reviewed and considered the Final Environmental Impact Report and found that the contents of said report and the procedures through which the Final Environmental Impact Report was prepared, publicized and reviewed comply with the provisions of CEQA, the CEQA Guidelines and Chapter 31.

7) The project sponsor has indicated that the presently preferred alternative modifies the preferred alternative in the EIR by, among other things, elimination of the ballpark restaurant, a reduction in on-site parking and an increase in public plaza space. As such, the project is a combination of the uses described in the Final Environmental Impact Report Project Description and the Reduced Project Alternative.

8) The City Planning Commission hereby does find that the Final Environmental Impact Report concerning File No.96.176E reflects the independent judgment of the City and County of San Francisco, is adequate, accurate and objective, and that the Summary of Comments and Responses contains no significant revisions to the Draft Environmental Impact Report, and hereby does CERTIFY THE COMPLETION of said Final Environmental Impact Report in compliance with CEQA and the CEQA Guidelines.

9) The Commission, in certifying the completion of said Final Environmental Impact Report, hereby does find that the project described in the Environmental Impact Report and as modified by the project sponsor and described above would have the following unavoidable significant impacts:

a. The Project would cause extensive queuing to occur on freeway on-ramps after weekday CITY

afternoon games and before weekday night games. Queuing would be increased further by cumulative development in the Project vicinity. Freeway on-ramps affected by the Project include eastbound freeway on-ramps to I-80 ("I-80)/Bay Bridge and westbound freeway on-ramps to I-80/U.S. Highway 101 at Fourth Street and Harrison Street. Additional on-ramps affected by the Project plus cumulative development include ramps westbound at Harrison and First Streets (to I-80 eastbound) and southbound on Fifth Street (to I-80 eastbound) and southbound on Fifth Street (to I-80 eastbound). No specific feasible improvements are available to address the impacts of ballpark traffic on freeways and freeway ramps, except for transit-related mitigation measures and travel demand management measures that would reduce but not eliminate the impacts of ballpark traffic on freeway on-and off-ramps.

b. The levels of service ("LOS") for some intersections in the Project vicinity would deteriorate to LOS E and F, signifying excessive delay (60 seconds or more) conditions. LOS of D (With delay in the range of 25 to 40 seconds) is the minimum acceptable operating condition for urban San Francisco streets. LOS E and F represent unacceptable operating conditions. No mitigation measures are available to The Project to improve all affected intersections to accepted levels of service beyond the measures already included in the Project.

c. Cumulative impacts on local transit systems include incremental increases and passenger loads on existing MUNI lines, and demand for new shuttle services to the ballpark and other South of market area destinations.

d. Traffic noise impacts identified in the 2015 UCSF-Mission Bay Cumulative Scenario would cause a substantial increase in traffic noise in the Mariposa/De Haro Street area. The transportation mitigation discussion includes a proposed detour for non-ballpark traffic that would route non-ballpark traffic from Third Street west to Seventh Street between King and Mariposa Streets before and after ball games. At Seventh and Townsend Streets, the detoured traffic would increase 8-hour CO concentrations to about 9.9 ppm, a new violation of eight-hour state and federal CO standards. No other location study would exceed the standards.

e. Violations of the state one-hour and state/federal eight-hour carbon monoxide (CO) standards are anticipated at almost all of the study intersection receptors in the year 2000. By the year 2015, one-hour and eight-hour CO concentrations would decline at the modeled receptors at the study intersections because of increasingly stringent vehicular CO emission controls expected to be implemented over the next 20 years, and no violations of the state and/or federal CO standards are anticipated. Transportation mitigation measures encouraging regional transit would reduce, but would not completely eliminate, vehicular air pollutant emissions below a level of significance.

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f. The FEIR states that Nitrogen oxide (No_x) emissions attributable to to the combination of ballpark traffic and traffic associated with other on-site uses in year 2000 of 101 pounds per day (lb/day) and in year 2015 of 82 lb/day would exceed the Bay Area Air Quality Management District's project threshold of 80 lb/day. Because the Project does not include the restaurant, the Project would not not exceed the BAAQMD threshold in the year 2015 and therefore the significant, unavoidable Nox impact for year 2015 and beyond is eliminated.

I hereby certify that the foregoing Motion was ADOPTED by the City Planning Commission on June 26, 1997.

Linda Avery
Secretary

AYES: Commissioners Lowenberg, Antenroe, Chinchilla, Mills, Joe, Hills, Martin

NOES: None

ABSENT: None

ADOPTED: June 26, 1997

I. SUMMARY

A. PROJECT DESCRIPTION

BACKGROUND

The San Francisco Giants major league baseball team (Giants) currently plays at 3Com Park at Candlestick Point (previously called Candlestick Park). Since its opening, 3Com has been the subject of complaints about poor public transit access and weather. These unfavorable conditions resulted in a number of efforts to finance and construct a new ballpark in San Francisco. In the last decade San Francisco voters were presented with several different proposals for a new ballpark. In 1987, voters defeated a ballot measure to locate a ballpark at Seventh and Townsend Streets in San Francisco. In 1989, a second measure to build a ballpark at China Basin was defeated. The 1989 measure included public financial assistance.

Under the direction of new ownership, the Giants are proposing to build a privately financed ballpark at China Basin. This is the subject of this Environmental Impact Report (EIR). The proposed ballpark was placed on the ballot as Proposition B, and received voter approval in March 1996. The measure amended the City Planning Code to establish development standards for a ballpark at China Basin. It also directed the City and County of San Francisco to adopt conforming amendments to its General Plan and other relevant plans and codes, and to request and apply for conforming amendments to all applicable state and regional plans and regulations. In addition, the measure created the Northeast China Basin Special Use District, adopted as Section 249.[18] of the City Planning Code.

INTRODUCTION

A new corporate entity affiliated with the San Francisco Giants, the China Basin Ballpark Company L.L.C. (CBBC) was formed for the purpose of developing a ballpark for the Giants on the waterfront at China Basin. The primary objective of the project sponsor (CBBC) is to develop and operate a ballpark and related facilities in San Francisco. The new facility is intended to improve conditions for fans and players and provide the amenities associated with a modern ballpark. The Giants selected the proposed location at China Basin because it would be convenient for San Franciscans, providing better public transit access and waterfront amenities.

The two-block project site is adjacent to San Francisco Bay and bordered by King Street, Second Street, China Basin Channel and Third Street. The California State Department of Transportation (Caltrans) owns the northern block (Lots 3B, 26 and 27 on Assessor's Block 3794) of the site bounded by Second, King, Third and Berry Streets. The Port of San Francisco is in the process of acquiring the Caltrans property. The southern portion of the site (Piers 46B and 46C on Assessor's Block 9900) is held in trust by the City and County of San Francisco.

PROJECT COMPONENTS

The proposed project includes demolition, construction and redevelopment of the site. Upon project completion, the site would be redeveloped with an open-air, natural grass ballpark and commercial facilities (see Figures II.D.1 and II.D.2).

The project would include an amendment to the *Rincon Point - South Beach Redevelopment Plan*, including the Design for Development document, adding the project site to the plan area, designating its land use as ballpark, adding the definition of ballpark use to the Project

Plan and the Land Use Plan for the South Beach subarea, and providing development standards, as described in II.F. Project Schedule, Cost and Approval Requirements.

The proposed project would consist of a 42,000-seat ballpark and an ancillary retail and commercial structure. The ballpark would be about 130 ft. high along the King Street frontage, with lighting structures about 175 ft. high. Pedestrian entrances would be located at each corner of the ballpark, and three entrances would be adjoined by public plazas. A loading and service area and approximately 180 parking spaces would be developed under the ballpark structure. Access to these facilities would be provided by a driveway from King Street at the northeast corner of the site. The ballpark structure would include about 35,000 sq. ft. of restaurant space at the southeast corner that would operate year-round. The 136,000-sq.-ft. retail and commercial structure, to be called the Pavilion Building, would front Third Street and also operate year-round. It would provide retail space on the ground level, and the Pacific Bell Children's Learning Center and Communications Center, broadcast studios, and the Giants executive offices on the upper floors. Surface parking would be provided for 25 to 30 vehicles at the Pavilion Building.

Approximately 355,000 sq. ft. of the 13-acre site would be enclosed by the ballpark's structure. Another 132,000 sq. ft. of the site would be covered with the playing field. The ballpark's total gross floor area would be about 1,248,000 gross sq. ft., including 171,000 gross sq. ft. of commercial/Pavilion Building facilities and 1,077,000 gross sq. ft. of baseball uses.

The primary use of the ballpark would be for approximately 80 Giants home baseball games per year. The ballpark may be used for events other than baseball, such as music and entertainment presentations or civic gatherings, that use up to the ballpark's proposed seating capacity of 42,000. By placing seating in the field, the ballpark's capacity for large special events could exceed 50,000 people; such events would occur no more than five times per year. Also under consideration is the erection of a temporary enclosed amphitheater within the ballpark which would seat approximately 5,000 to 15,000 patrons. The enclosed

amphitheater could be used during the off-season for 30 to 40 "tent" events (such as music concerts) each year.

The scoreboard system would include at least one scoreboard with full-color instant-replay video capabilities, matrix board/message boards, auxiliary and line scoreboards, exterior message center board and advertising panels and other signs. The primary scoreboard, located in centerfield, would be about 125 ft. above the playing surface at its highest point. A smaller display board would be located above the arches in the right-field wall.

The lighting plan for the ballpark calls for lighting banks at the structure's upper levels on standards approximately 175 ft. high. These banks would be designed to illuminate various zones on the playing field.

The ballpark's King Street facade would feature brick with stone trim and large industrial-style windows, reflective of the older commercial buildings across King Street and elsewhere in the South of Market area. The design of the ballpark places seating close to the playing field, with sight lines for baseball optimized, and viewing unobstructed by structural supports.

The waterfront would serve as a key element in the project design (see Figure II.D.6). Nearly all of the ballpark's waterfront frontage would be just beyond the right-field wall (see Figure II.D.7). The existing waterfront area at Pier 46B, now closed to pedestrians, would be improved to provide access to the ballpark and waterfront. Pedestrians on the walkway along the waterfront could see into the ballpark through a series of arched openings that would provide a direct view of the playing field. Proposed improvements to the existing walkway surface include the application of a new patterned concrete surfacing with a salt or exposed aggregate finish.

The parking plan calls for at least 5,000 dedicated parking spaces to be provided on an interim basis immediately south of China Basin Channel on about 40 acres owned by the Catellus Development Corporation and the Port of San Francisco (see Figure II.D.5).

The project would result in the demolition of eight one- and two-story structures north of Berry Street, containing about 111,000 sq. ft. of floor area; some have already been partially demolished previously for the widening of King Street. South of Berry Street, three one- and two-story Port-owned structures with about 316,000 sq. ft. of floor area would be demolished. Construction of the ballpark would commence immediately after demolition is complete, and is expected to take about 29 months. The ballpark is scheduled to open in April 2000.

APPROVALS

San Francisco Redevelopment Agency Commission

The proposed project includes an amendment to the *Rincon Point - South Beach Redevelopment Plan*, including the Design for Development document. The proposed amendment would add the project area to the plan area, designate its land use and provide certain development standards (see II.D. Project Characteristics, p. II.7). The Redevelopment Plan amendment would require approval by the Redevelopment Agency Commission and Board of Supervisors.

The following specific actions would need to be taken by the Redevelopment Agency Commission: joint certification of the EIR with City Planning Commission; CEQA findings; adoption of Redevelopment Plan amendment; and authorization of Owner Participation Agreement.

Planning Commission

The following specific actions would need to be taken by the Planning Commission: certification of EIR and adoption of mitigation monitoring program; CEQA findings; determination of and recommendation regarding General Plan consistency of Redevelopment Plan amendment and street vacations; General Plan amendments; and Conditional Use Authorization.

Zoning Administrator

The Zoning Administrator would need to grant approval of the proposed dedicated parking as an interim use in the Mission Bay area south of China Basin Channel.

Port Commission

The following specific actions need to be taken by the Port Commission: adoption of mitigation monitoring program; CEQA findings; acquisition of Caltrans parcel; authorization of street vacations, ground lease and Public Trust/Burton Act findings; possible *Waterfront Land Use Plan* amendment and findings of consistency with the *Waterfront Land Use Plan* (if adopted); and issuance of demolition and building permits.

Board of Supervisors

The following specific actions would need to be taken by the Board of Supervisors: CEQA findings and adoption of mitigation measures; approval of Port's acquisition of Caltrans

parcel; consistency findings and authorization of street vacations; ground lease; Redevelopment Plan amendment; and General Plan amendments.

Department of Public Works

The Department of Public Works would need to approve a Parcel Map for reconfiguration of lot lines.

Bay Conservation and Development Commission

The project is also subject to approval by the San Francisco Bay Conservation and Development Commission (BCDC). BCDC has authority over lands located within 100 ft. of the shoreline. The ballpark would be reviewed by BCDC for compliance with requirements set forth in the *San Francisco Bay Plan* and *San Francisco Waterfront Special Area Plan*. The following specific actions would need to be taken by BCDC: Major Permit approval for uses within 100-ft. shoreline band and Bay; approval for new fill associated with public access improvements.

State Lands Commission

As the project would be located on land subject to the public trust, the ballpark and its associated uses must be consistent with the public trust as required by the State Constitution and relevant court decisions. Although no permit is required in connection with the public trust, in approving the ground lease for the project, the Port Commission must determine that the ground lease is consistent with the public trust and the Burton Act. In addition, both to

memorialize the consistency of the project with the trust and to facilitate project financing, the State Lands Commission would be requested to review and approve the ground lease.

Other Approvals/Actions

The following are other actions required for the project:

- California Transportation Commission: approval of sale of Caltrans parcel to the Port.
- Regional Water Quality Control Board: approval of soil remediation plan; review of Soil Management Plan.

B. MAIN ENVIRONMENTAL EFFECTS

CONSISTENCY WITH EXISTING PLANS AND POLICIES

The project is subject to the policies and regulations of a number of public agencies. The entire project site is within the jurisdictional boundaries of the City and County of San Francisco (the City). Portions of the project site are controlled primarily by City policies and plans, while other portions are subject to additional regulations and policies of other agencies.

The proposed ballpark is inconsistent with several General Plan policies as they are currently stated. Proposition B directed the San Francisco Board of Supervisors, Planning Commission and other officials to amend the City's General Plan and other codes and ordinances in a manner consistent with Proposition B. In addition, Proposition B directed such officials to "...request and apply for conforming amendments to all applicable state and regional plans and regulations."

The City has proposed General Plan amendments pursuant to Proposition B to ensure that the project is consistent with the overall General Plan policies and objectives. These amendments include modifications to the Urban Design, Recreation and Open Space, and Northeast Waterfront Plan elements as described in the "Proposed Ballpark Master Plan Amendments" produced by the Planning Department in connection with its consideration of the Preliminary Plan for the ballpark.

The portion of the project site south of the Berry Street right-of-way between Third Street and Second Street is within the jurisdictional boundaries of the Port of San Francisco (the Port). As described in III.A. Consistency with Existing Plans and Policies, the Port is now reviewing the *Draft Waterfront Land Use Plan* which, if adopted, would be the comprehensive land use planning document of that agency. If the *Draft Waterfront Land Use Plan* is adopted prior to the Port's issuance of the required permits and approvals for the ballpark, amendments to the *Draft Waterfront Land Use Plan* would be included as part of the project to ensure consistency between the proposed uses and relevant *Waterfront Land Use Plan* policies. Otherwise, consistency issues between the proposed project and existing policies would need to be resolved as part of the project.

The portion of the project site within 100 ft. of the shoreline is within the permit jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC), created by the McAteer-Petris Act (California Public Resources Code Sections 66600 *et seq.*). The proposed ballpark would be reviewed by BCDC for compliance with requirements set forth in the McAteer-Petris Act, the regulations promulgated pursuant thereto, and BCDC plans and policies including the *San Francisco Bay Plan* and *San Francisco Waterfront Special Area Plan*.

The portion of the project site south of the Berry Street right-of-way including Pier 46B consists of lands which are administered by the City and County of San Francisco, through its Port, pursuant to Chapter 1333 of the Statutes of 1968, as amended, commonly referred to as the Burton Act. The Port's acquisition of the Caltrans property to the north of Berry

Street will also subject that property to the Burton Act. The public trust applies to current Burton Act lands and will apply, pursuant to Chapter 11 of the statutes of 1984, to the Caltrans property lands when acquired by the Port. The State Lands Commission will have a role in an oversight capacity, to review compliance with the public trust restrictions and the Burton Act.

The portion of the project site within the *Rincon Point - South Beach Redevelopment Plan* is designated "Park" under the Plan and has been proposed for expansion of South Beach Park. The Redevelopment Agency plans to reconfigure the proposed extension of South Beach Park with underground parking to serve visitors to the harbor. Under the contemplated revisions the agency will no longer require the portion of the Plan area that includes the ballpark site for the proposed South Beach Park extension. The *Rincon Point - South Beach Redevelopment Plan* would be amended as part of the project to exclude this portion from the area proposed for ballpark development. The project also includes amendments to the *Rincon Point - South Beach Redevelopment Plan* as discussed above.

LAND USE

Construction of the proposed ballpark would result in the demolition of the eight existing one- and two-story buildings on the northern portion of the project site containing commercial, and light manufacturing, and would eliminate about 300 public parking spaces. The project would demolish two warehouse buildings on Piers 46B and 46C, and 95 Berry Street (a small one-story building west of Pier 46C) on the southern portion of the project site containing commercial, light manufacturing and maritime-related activities. The private businesses housed in these 11 buildings would be displaced by the demolition. The Port is currently pursuing relocation of its Maintenance Operations Facilities from Pier 46B to Pier 48 in August 1997 to provide more-efficient operations; the Port will relocate the facility to Pier 50 on an interim basis.

The existing structures and uses on the site would be replaced by a 42,000-seat, open-air ballpark and related commercial and restaurant facilities. The ballpark would include a four-story structure called the Pavilion Building fronting on Third Street. The Pavilion Building would contain retail, office, broadcast studio and educational facilities, as well as the Giants' administrative offices.

The major new use the proposed project would introduce is an open-air ballpark where people could attend ballgames, concerts and other events. These events would attract substantial numbers of visitors year-round. The development of a ballpark, commercial and restaurant uses would greatly increase pedestrian volumes and nighttime activity and is likely to create demand for ground-floor retail, commercial, restaurant and bar space in the vicinity. The *Rincon Point - South Beach Redevelopment Project Area Plan* encourages the development of multi-family housing neighborhoods and neighborhood-serving commercial use. The ballpark and associated uses, and development in Mission Bay, could encourage additional commercial development. This is likely to increase the pace of new development in this area.

The presence of a large number of people in the vicinity before and after games and other events would impact surrounding land uses through increases in traffic, increased noise and lighting effects which are described in those impact sections. Ballgames and other events occurring on weekends could annoy and inconvenience people trying to visit and use non-ballpark facilities in the area, such as the marina, local businesses, and residences. Although some advance planning would be needed to coordinate South Beach Harbor and park activities with the ballgames, it is possible that development of the ballpark could stimulate local businesses through increased pedestrian traffic yielding increased patronage.

Land uses in the surrounding area include residential along The Embarcadero; small-scale commercial and office to the northwest; and rail, parking and industrial uses to the west and south. Residential uses are expected to increase west and south of the project site, and

entertainment/commercial space is being proposed to the west. Approximately 5,000 dedicated ballpark parking spaces are planned on an interim basis in the Mission Bay South of Channel area. Maritime, recreational and other uses south of the Channel would experience day-of-event impacts, including delays due to increased pedestrian and auto activity.

South Beach Park currently provides local office workers, residents, and tourists with open space, public benches, and waterfront views. The *Rincon Point - South Beach Redevelopment Plan* calls for expansion of this park adjacent to the project site. The ballpark and its related commercial uses would encourage greater pedestrian activity in the vicinity of the park. The Port Walk, an accessway planned along the waterfront at the ballpark site, would provide new public access and a pedestrian-friendly environment. This would draw visitors further south along the waterfront.

VISUAL QUALITY AND LIGHTING

Ballpark

The design intent of the project is to reflect the urban quality of baseball architecture that prevailed in the early part of this century. The ballpark is designed to fit its urban context. The ballpark's King Street facade features brick with stone trim and industrial-style windows. The main entrance to the ballpark would be at the intersection of King and Third Streets, identified by a pedestrian plaza. Pedestrian entrances would be located at each of the four corners of the project site.

The King Street facade would extend to a height of about 78 ft. above street level and traverse a full city block between Second and Third Streets, a distance of about 900 ft. A clock tower set into the facade at each end of the structure would rise to about 125 ft. at its peak. The ballpark seating bowl would rise to a height of about 112 ft. above the King Street frontage. The scoreboard would be about 125 ft. above the playing field and light standards would rise to about 175 ft.

From The Embarcadero looking south, South Beach Park, other pedestrian areas, the seating bowl and supporting steel structure would be visible. Because of its height and structural

supports for seating and lighting, the ballpark would be seen as an element larger in scale and height than most nearby structures.

The Port Walk on the project site adjacent to China Basin would offer views of the ballpark, the San Francisco waterfront area and the Bay.

From longer range views, such as Potrero Hill, the ballpark would be partially visible, but would not substantially obstruct views of the Bay.

Ballpark Lighting and Scoreboard

The playing field would be illuminated by three sets of light standards, one at centerfield, one along the left-field line and another along the right-field line. The light standards would be the highest structural elements at the ballpark. There would be two panels of lights on each side of the playing field and a third panel in centerfield.

The ballpark would substantially increase light intensities at the site during approximately 40 night games per year. Night illumination of outdoor areas can affect people in several ways. For example, where intense lighting is viewed against a dark background, the contrast attracts the attention of the viewer and can be considered annoying. Under low-light conditions, the human eye adjusts to the brightest light within the field of view. If the range of light intensity to which the eye is exposed is large, the eye will be relatively insensitive to the more dimly lighted areas within the field of view. In addition, increased illumination can affect the suitability of sleeping areas, use of outdoor areas at natural light levels, and privacy. The degree of impacts may be related to the degree of change from the illumination levels to which people have become accustomed.

In general, from street-level locations and in South Beach Harbor, the illumination from the light standards would be seen at their source, but there would be no obtrusive light or glare that would impair vision. North of the ballpark, residential areas generally are considered to be the most sensitive receptors for light-producing activities. From the South Beach Marina Apartments, spill light would be unobtrusive; however, the illumination from the lighting fixtures would be seen at their source. Because lighting elements of the outfield and right-field banks would be directly viewable, and because there would be no strong background lighting source to reduce the contrast between the ballpark lighting and ambient lighting, residents could find light and glare emanating from the ballpark to be obtrusive. It would be expected that the visual impact of the proposed ballpark lighting as seen from Potrero Hill would be less than that produced by a full bright moon.

The proposed project would include development of about 40 acres of paved parking areas, for approximately 5,000 vehicles south of China Basin Channel. The parking lighting has not yet been designed, so no plan was available for evaluation. Without mitigation, it is possible that light levels from the parking areas could be seen as glaring from residential areas on the north and east slopes of Potrero Hill.

SHADOWS AND WIND

Shadows

The proposed ballpark would cast new shadows on streets, sidewalks, buildings, and existing and proposed open space in the vicinity of the project site. New shadows would be most substantial during fall and spring afternoon periods.

Currently, pedestrian traffic in the project area is light. Increases in pedestrian use can be expected to result from activities at the ballpark and the construction of an extension of South Beach Park. Given the substantial pedestrian traffic that would be expected in the area with

the ballpark, the analysis examines afternoons, when the highest concentration of pedestrians is likely to be in the area and affected by shadow. The times selected for analysis are 12:00 p.m., 3:00 p.m. and 5:00 p.m., Pacific Standard Time (PST) in March and December, and Pacific Daylight Time (PDT) in June and September.

South Beach Park and its proposed extension would be under the jurisdiction of the San Francisco Redevelopment Agency, and therefore would not be subject to Planning Code Section 295. Section 295 limits new shading on public open space under the jurisdiction of the San Francisco Recreation and Park Commission. The project would not add new shade to any open space in Recreation and Park jurisdiction. Project shadows would extend into 10 percent or less of South Beach Harbor pier, boat slips or water areas, during mid- to late-afternoons in fall, winter and spring months. South Beach Harbor is a recreational area, accessible to harbor tenants. The shadow effects would not occur in an area that is generally publicly accessible.

This discussion assumes that the proposed extension of South Beach Park would be completed. Shadows from the ballpark would not reach the existing South Beach Park at most times of the day during the year. New shadows from the project would generally shade the proposed extension. During December afternoons, the ballpark, centerfield, scoreboard and lighting structures would shade streets and sidewalks, and up to 15 percent of South Beach Park and the proposed extension, during the hours analyzed. On March afternoons, the project would shade streets and sidewalks, and up to 20 percent of the proposed extension of South Beach Park at 3:00 p.m. PST. It would shade about half of the total area of the park at 5:00 p.m., primarily in the proposed extension, and on a small part of the existing South Beach Park. In June, the project would shade less than 5 percent of the proposed extension of South Beach Park at 3:00 p.m. PDT, and about 25 percent at 5:00 p.m. In September, in addition to new shadows on streets and sidewalks, the project would shade less than 10 percent of the park at 3:00 p.m. PDT, and about one-third at 5:00 p.m.

Wind

Average wind speeds are greatest in the summer and least in the fall, varying from lightest in the early morning to strongest in the afternoon, most frequently blowing from the west and northwest. Large buildings can redirect winds, thereby affecting pedestrian comfort, depending on such factors as sun exposure, temperature and clothing. The proposed ballpark site is not located within a use district for which the City Planning Code has established wind speed criteria. For purposes of analysis, this EIR uses the wind speed criteria for pedestrian comfort and hazardous winds established in the City Planning Code for the C-3 District: the 11 mph pedestrian comfort criterion, and the hazard criterion in the City Planning Code.

In the existing wind environment in the site vicinity, 39 of the 46 primary test locations tested without the ballpark now exceed the 11-mph pedestrian-comfort criterion. Wind speeds in pedestrian areas range from 5 mph to 19 mph. Winds are 11 mph or less at 7 of the 46 locations and 18 mph or 19 mph at 12 of the 46 locations. In general, the wind conditions in the vicinity of the site may be attributed to the open nature of the area and lack of wind protection provided by buildings or many trees.

The wind hazard criterion is currently exceeded at 2 of the 46 locations. The total duration of all of the existing hazard exceedances is about 18 hours per year. Hazard conditions occur on King Street mid-block between Second Street and The Embarcadero (about 2 hours per year) and at the south end of the proposed extension of South Beach Park (about 15 hours per year).

The project would reduce existing wind speeds at 30 of the 46 test locations, leave them unchanged at 12 locations and increase speeds at 4 locations. With the project, among the 46 locations, the project would add two new pedestrian wind comfort criterion exceedances and would eliminate six existing exceedances, for a net total of 35 out of the 46 locations. The pedestrian wind criterion would be exceeded at 15 of 23 additional project-specific locations

on the public concourses within the ballpark. Overall, the pedestrian wind criterion would be exceeded at 50 of the total of 69 pedestrian locations. Seating areas within the ballpark were not tested for the EIR.

The project would eliminate existing exceedances of the hazard criterion at two locations. At one of these locations, the wind speed with the ballpark would be 36 mph, but would not reach the one full hour needed to exceed the hazard criterion.

Future development of the presently undeveloped Mission Bay area upwind of the ballpark would be expected to affect the wind environment of the ballpark and would modify the wind effects of the ballpark itself. The wind environment of the project plus potential cumulative development would be similar to that of the project, but in general would reduce wind speeds. Compared with the project, wind speeds would decrease at 38 locations, increase at 13 locations, and remain the same at 18 locations. Overall, the project plus potential cumulative development scenario would add three pedestrian wind comfort criterion exceedances and would eliminate 18 project pedestrian wind comfort criterion exceedances, for a net total of 35 comfort criterion exceedances out of all 69 pedestrian test locations, a net reduction of 15 exceedances, relative to the project.

Cumulative development would eliminate one project hazard criterion exceedance and reduce the duration of the other. The wind speed at one other location near Pier 40 would be 36 mph, but would not reach the one full hour needed to exceed the hazard criterion.

TRANSPORTATION AND CIRCULATION

The transportation analyses for the proposed ballpark project included the traffic impacts of relocating baseball activities from Candlestick Point to China Basin; the effects of the greater availability of transit services in the China Basin area; the impacts on transit facilities;

pedestrian impacts; and an analysis of parking supply and demand. The analyses were carried out for the project as proposed, and for the project with two different scenarios of cumulative growth and related growth in use of the transportation system. (Page number references are to pages in the Impacts text.)

Traffic Impacts (See pp. IV.115 - IV.172)

To account for ballgames and other events which could begin or end at similar times, the traffic impacts analysis for the ballpark project was carried out for four time periods to account for different baseball game times: after weekday afternoon games (3:30 - 4:30 p.m.), assuming a 12:35 p.m. start time; before and after weekday night games (6:30 - 7:30 p.m. and 10:30 - 11:30 p.m.) assuming a 7:35 p.m. start time; and after weekend day games (4:00 - 5:00 p.m.) assuming a 1:05 p.m. start time, all assuming an average game length of 3 hours. All ballgame traffic analyses assumed a sold-out game, with 42,000 tickets sold and 39,000 fans in attendance (a conservative 6 percent "no-show" factor).

Because the project would include year-round uses in addition to ballgames, an additional analysis was prepared for the weekday afternoon p.m. peak hour (4:30 - 5:30 p.m.) to determine impacts caused by employee and visitor trips to the site on a non-game day. Project traffic was added to existing traffic for an analysis of impacts of the project alone. Project-plus-existing traffic was then added to traffic growth projected for the year 2015 to provide cumulative-plus-project impacts results. Analyses were carried out for freeway segments and on- and off-ramps near the project site, for arterials near the site that are included in the County Congestion Management Plan, and for local intersections. Analyses of freeway segments, arterials and intersections are presented in terms of level of service (LOS), with LOS A to D considered acceptable traffic flow, and LOS E and F considered unacceptable delay for most locations. The freeway ramp analysis is presented in terms of additional queue length (length of the line of cars backed up on local streets waiting to access the freeway).

Mitigation measures, including a preliminary traffic routing plan, have been developed which are intended to reduce significant traffic impacts. A separate analysis of the project and cumulative traffic with the preliminary traffic routing plan was prepared for each of the four time periods studied for game day traffic, and that analysis is described in V.B. Transportation mitigation measures (see pp. V.17 - V.40). The mitigation measures, including the preliminary traffic routing plan, are separately summarized in the transportation mitigation measures summary, below (p. I.47). The summary of impacts presented here does not include the effects of the proposed mitigation measures. As described in V.B. Transportation Circulation, even with the application of mitigation measures, these measures would not reduce the traffic impacts of the project below the level of significance.

The traffic impacts analysis included a number of conservative assumptions. For example, existing vehicle trips to and from the uses now on site that would be displaced were not subtracted from the total number of vehicle trips assumed to be generated by the proposed ballpark uses; no attempt was made to quantify the amount of existing traffic on local streets or on freeways that would divert to other routes, other travel modes or other times of travel in order to avoid ballgame travel, although it is logical to assume that some people would make these choices; the analysis assumes all ballgames would be sellout games, although market research suggests that sellout games would occur 40 percent of the time or less often; and the impacts of the proposed new ballpark were compared with the typical existing traffic on streets and freeways, not with existing conditions on freeways and streets on a baseball game day at 3Com Park.

Freeway Segments (See pp. IV.115 - IV.123)

The analysis of freeway segments studied freeways near the proposed project site. Segments of U.S. 101 near 3Com Park are congested because of ballgame traffic under existing conditions. The proposed project would cause this freeway congestion to shift to segments of

U.S. 101, Interstate 80 (I-80) and Interstate 280 (I-280) that are close to the China Basin site.

Freeway traffic which is forecast to be generated by the project was added to the observed existing traffic volumes on eight segments of U.S. 101/Interstate 80 and Interstate 280 at three analysis times. Table I.B.1a lists segments of freeways likely to be used by ballpark traffic that would show decreases to LOS E or F because of ballgame traffic. It also shows freeway impacts from employee and visitor traffic on non-game days.

The cumulative-plus-project analysis included regional growth through the year 2015, as predicted by the regional transportation model (prepared by Metropolitan Transportation Commission staff), adjusted for current plans in the waterfront area under the Port's Draft *Waterfront Land Use Plan*, in the Mission Bay planning area, in the Transbay Terminal planning area and in the Rincon Point-South Beach Redevelopment Area, all near the project site. Table I.B.1b shows freeway segments that would degrade to LOS E or F in the cumulative-plus-project conditions, compared to existing-plus-project conditions. After weekday afternoon games (3:30 - 4:30 p.m.), LOS F would already occur on eastbound I-80 because of project traffic alone and thus is not shown on the table; the addition of traffic from cumulative growth would extend congestion on the approaches to this freeway segment and the Bay Bridge, and would extend the time during which Bay Bridge approaches experienced unacceptable delay.

A second cumulative analysis was prepared assuming that the University of California at San Francisco would develop its proposed major new campus in the southern portion of the Mission Bay planning area and that Catellus Development Corporation would complete development of the rest of the Mission Bay area by the year 2015. This scenario is called the "UCSF/Mission Bay Cumulative Scenario." The freeway traffic from this scenario, including project traffic, was compared to the cumulative-plus-project traffic volumes for the analysis times. After weekday afternoon games (3:30 - 4:30 p.m.), the UCSF/Mission Bay Cumulative Scenario with project traffic would cause further delays on the eastbound

TABLE I.B.1
SUMMARY OF IMPACTS ON FREEWAY SEGMENTS*

a. COMPARISON OF EXISTING WITH EXISTING-PLUS-PROJECT TRAFFIC

Segment	Change in LOS to E or F
Weekday Afternoon Post-Game 3:30 - 4:30	
U.S. 101 South of 3rd Southbound	D → E
I-280 Southbound and South of Mariposa St	C → E
I-80 Bay Bridge Eastbound	E → F
Weeknight Pre-Game 6:30 - 7:30	
U.S. 101 Northbound South of 3rd	D → E
Weekend Day Post-Game 4:00 - 5:00	
U.S. 101 South of 3rd Southbound	D → E
I-80 Bay Bridge Westbound	D → E
Non-Game Day 4:30 - 5:30	
I-80 Bay Bridge Westbound	E → F

b. COMPARISON OF EXISTING-PLUS-PROJECT WITH CUMULATIVE-PLUS-PROJECT

Segment	Change in LOS to E or F
Weekday Afternoon Post-Game 3:30 - 4:30	
U.S. 101 South of 3rd Southbound	E → F
U.S. 101 North of C. Chavez, Southbound	E → F
Weeknight Pre-Game 6:30 - 7:30	
I-80 Bay Bridge Westbound	D → E
Weeknight Post-Game 10:30 - 11:30	
I-80 Bay Bridge Eastbound	D → E
Weekend Day Post-Game 4:00 - 5:00	
U.S. 101 North of C. Chavez, Northbound	D → E
Non-Game Day 4:30 - 5:30	
U.S. 101 North C. Chavez, Southbound	E → F
U.S. 101 South of 3rd, Southbound	E → F

c. COMPARISON OF CUMULATIVE-PLUS-PROJECT WITH UCSF/MISSION BAY CUMULATIVE SCENARIO PLUS PROJECT

	Change in LOS to E or F			
Segment	Post Weekday Afternoon	Pre Weekday Night	Post Weekend Day	Non Game Day
U.S. 101 South of 3rd, Southbound		D→E	E→F	
U.S. 101 South of 3rd, Northbound	D→E			E→F
U.S. 101 North of C. Chavez, Northbound	D→E			
U.S. 101 North of C. Chavez, Southbound				
I-280 South of Mariposa St, Northbound		D→E		
I-280 South of Mariposa St, Southbound	E→F		D→E	D→E
I-80 Bay Bridge, Eastbound				E→F
I-80 Bay Bridge, Westbound			D→E	

* Eight freeway segments were studied, each for four different times: after weekday afternoon games (3:30-4:30 p.m.), before weekday night games (6:30-7:30 p.m.), after weekday night games (10:30-11:30 p.m.) and after weekend day games (4:00-5:00 p.m.).

I-80/Bay Bridge freeway segment, which already would be at LOS F in the cumulative-plus-project scenario. Table I.B.1c shows freeway segments that would decline to LOS E or F as a result of the UCSF/Mission Bay Cumulative Scenario with the project, from service levels under the base cumulative-plus-project scenario.

Freeway Ramps (See pp. IV.124 - IV.135)

Project impacts at primary freeway on- and off-ramps serving the traffic study area would be distributed among ramps connecting with I-80 at First, Fourth and Fifth Streets; and ramps connecting with I-280 at King and Sixth Streets. The most substantial impacts generally would occur on weekday afternoons during the 3:30 - 4:30 p.m. hour on the ramps leading to I-80, both east- and westbound. Ballpark traffic would overlap with existing peak hour queues after weekday afternoon games, or events, and would overlap somewhat with the end of existing peak period queues before weekday night games. Under free-flow conditions on the freeway, such as occur on I-80 and U.S. 101 in the late evening after a weekday night game, on-ramps would not experience severe delays and project traffic would have minimal impacts on freeway ramps.

Under existing conditions, the eastbound on-ramps to I-80/Bay Bridge and the westbound on-ramp to I-80/U.S. 101 at Fourth and Harrison Streets have severe queuing problems in the p.m. peak period (4:30 - 6:30 p.m.). Vehicle queues usually "spill" back from the ramps to all approaches leading to each on-ramp. Project traffic would add substantially to queues at three locations after a weekday game, and at one location before a weekday night game, as shown on Table I.B.2a. Queues on all other approaches at freeway ramps studied would increase by 500 ft. or less.

Traffic conditions on U.S. 101, which are already congested in the afternoon and ea evening, would worsen on baseball game days, as occurs now when games are played at

TABLE I.B.2
SUMMARY OF FREEWAY RAMP QUEUE LENGTH INCREASES[1]

a. PROJECT QUEUE

Segment	Queue Increase[2]
Weekday Afternoon Post-Game 3:30-4:30	
Harrison/Essex EB I-80 ramp	>5,000'
Harrison/Fourth WB I-80 ramp	3,500'
Weeknight Pre-Game 6:30-7:30	
WB Harrison/First EB I-80 ramp	1,000'

b. CUMULATIVE-PLUS-PROJECT QUEUE

Segment	Queue Increase[2]
Weekday Afternoon Post-Game 3:30-4:30	
Harrison/Essex EB I-80 ramp	>5,000'
WB Harrison/First EB I-80 ramp	4,500'
Harrison/Fourth WB I-80 ramp	>5,000'
SB Fifth Street to EB I-80 ramp	>5,000'
Weeknight Pre-Game 6:30-7:30	
WB Harrison/First EB I-80 ramp	1,500'
Harrison/Fourth WB I-80 ramp	1,000'

c. UCSF/MISSION BAY CUMULATIVE SCENARIO-PLUS-PROJECT QUEUE

Segment	Queue Increase[2]
Weekday Afternoon Post-Game 3:30-4:30	
EB Harrison/Essex EB I-80 ramp	>5,000'
WB Harrison/First I-80 ramp	4,500'
WB Harrison/Fourth WB I-80 ramp	>5,000'
SB Fifth Street EB I-80/Bay Bridge	>5,000'
EB Bryant Street EB I-80/Bay Bridge	2,000'
Weeknight Pre-Game 6:30-7:30	
EB Harrison/Essex EB I-80 ramp	2,000'
WB Harrison/First EB I-80 ramp	2,000'
WB Harrison/Fourth I-80 ramp	2,500'
EB Bryant/Fifth EB I-80/Bay Bridge	1,500'

Notes:
WB = westbound; EB = eastbound; > = greater than
1. Four freeway ramps were studied (for a total of nine directions, as all ramps studied can be approached from at least two directions) for two time periods - post weekday afternoon games (3:30 - 4:30 p.m.) and pre weekday night games (6:30 - 7:30 p.m.).
2. Queue increase shows about how much longer, in feet, queues would be than existing queues at the freeway ramps studied.

3Com Park. Congestion from traffic caused by the new ballpark might result in increased use of the ramps at Vermont and Cesar Chavez Streets; however, because there is capacity available to divert much of this traffic to I-280, ballgame traffic is not likely to create substantial impacts on these ramps.

Cumulative-plus-project impacts at freeway ramps would be most severe during the 3:30 - 4:30 p.m. period after weekday afternoon games; the queue increase would be over 5,000 feet on three ramps. Shorter queue increases would occur before weekday night games on three ramps. (See Table I.B.2b.) The afternoon queues would be long enough that many drivers would not choose to wait but would search for other routes or would choose to re-park and wait until queues dissipated somewhat before returning home after an afternoon game.

Impacts after weekday night and weekend day games would be minimal on freeway ramps under both existing-plus-project and cumulative-plus-project conditions.

The UCSF/Mission Bay Cumulative Scenario for 2015, including project traffic, would add more traffic to already congested freeway ramps both after a weekday afternoon game and before a weekday night game. As shown on Table I.B.2c, weekday afternoon queues would range from 2,000 to greater than 5,000 feet longer than existing queues, primarily on Harrison Street. Weekday evening queues would range from 1,500 to 2,500 feet longer.

Queuing at I-280 on-ramps is related to the way intersections operate at the ramps, rather than to congestion on the freeway itself, unlike ramps leading to I-80 and U.S. 101. Therefore, the analysis for I-280 is included in the intersection analysis.

On non-game days, employees and visitors at the ballpark and at non-baseball uses at the project site would add to traffic using freeway ramps during the p.m. peak hour (4:30 - 5:30 p.m.). Queue lengths would not increase substantially because of project non-game day traffic alone. With cumulative traffic growth, queue lengths on most freeway ramps would

increase by 1,000 feet or more, and with UCSF/Mission Bay cumulative growth would extend up to 2,500 feet further in some locations. The project would contribute only a few cars to these increases.

Arterials (See pp. IV.135 - IV.144)

The impacts of the project on 17 study area arterial streets which are part of San Francisco's Congestion Management Plan network were analyzed for the EIR for traffic after a weekday afternoon game (3:30 - 4:30 p.m.) and before a weekday night game (6:30 - 7:30 p.m.). Project traffic would have minimal impacts on arterial streets during the post-weekday night and post-weekend game periods.

- After a weekday afternoon game (or events) from 3:30 to 4:30 p.m., some arterials leading from the ballpark and dedicated parking would degrade from acceptable levels of service to LOS F, and arterials near I-80 freeway ramps would degrade from already congested LOS E to LOS F because of project traffic alone, as shown on Table I.B.3a. Before weekday night games (6:30 - 7:30 p.m.), ballgame traffic heading toward the ballpark area would mix with the end of the p.m. peak commute traffic, causing LOS F conditions mainly in the South of Market area (see Table I.B.2a).

Cumulative-plus-project traffic would cause additional congested conditions on some arterials in the study area, compared to project traffic alone (see Table I.B.3b). Three additional street segments would degrade to LOS E or F following weekday afternoon games. Three additional street segments would degrade to LOS F before weekday night games, compared to existing-plus-project conditions.

TABLE I.B.3
SUMMARY OF IMPACTS ON ARTERIALS*

a. COMPARISON OF EXISTING WITH EXISTING-PLUS-PROJECT TRAFFIC

Segment	Change in LOS to E or F
Weekday Afternoon Post-Game 3:30 - 4:30	
Third St.	
Berry to Market NB	C → F
Mariposa to Berry NB	B → F
Harrison St.	
Fourth to Seventh WB	E → F
First to Embarcadero EB	D → F
Embarcadero to First WB	E → F
Embarcadero	
Second to Howard NB	C → F
Weeknight Pre-Game 6:30 - 7:30	
Fourth Street	
Market to Harrison SB	E → F
Harrison to Third SB	C → F
Fifth St.	
Harrison to Brannan SB	D → F
Sixth Street	
Howard to Brannan SB	C → F
Harrison St.	
Embarcadero to First WB	C → F
Bryant St.	
Seventh to Fourth EB	C → F
Non-Game Day 4:30 - 5:30	
Embarcadero	
Second to Howard NB	D → F

b. COMPARISON OF EXISTING-PLUS PROJECT WITH CUMULATIVE-PLUS-PROJECT

Segment	Change in LOS to E or F
Weekday Afternoon Post-Game 3:30 - 4:30	
Third St.	
Berry to Mariposa SB	C → F
Bryant St.	
Fourth to Embarcadero EB	B → E
Embarcadero	
Howard to Second SB	C → E
Weeknight Pre-Game 6:30 - 7:30	
Third Street	
Mariposa to Berry NB	B → F
Berry to Mariposa SB	B → F
Harrison St.	
First to Embarcadero EB	C → F
Non-Game Day 4:30 - 5:30	
Third Street	
Mariposa to Berry NB	C → F
Harrison St.	
First to Embarcadero EB	D → F
Bryant St.	
Seventh to Fourth EB	D → F
Embarcadero	
Howard to Second SB	C → F

c. COMPARISON OF CUMULATIVE-PLUS-PROJECT WITH UCSF/MISSION BAY CUMULATIVE SCENARIO PLUS PROJECT

Segment		Change in LOS to E or F: Weekday Afternoon Post-Game 3:30 - 4:30	Change in LOS to E or F: Non-Game Day
Bryant St.	Fourth to Embarcadero EB	E→F	
Embarcadero	Second to Howard NB	E→F	
Third St.	Berry to Mariposa SB		C→F

* Seventeen arterial street segments were studied for two time-periods: 3:30 to 4:30 p.m. and 6:30 to 7:30 p.m. Ballgame traffic was determined to have minimal impact on arterials after weekday night games and after weekend day games.
NB = Northbound SB = Southbound EB = Eastbound WB = Westbound

The UCSF/Mission Bay Cumulative Scenario in 2015 with the project would increase delay on two additional study arterials after weekday afternoon games, compared to base cumulative conditions (see Table I.B.3c).

On non-game days, project employees and visitors would contribute to p.m. peak hour traffic (4:30 - 5:30) on The Embarcadero northbound between Second and Harrison Streets. With cumulative growth in 2015, project employees and visitors would contribute to deterioration to LOS F of four additional arterials; and under the UCSF/Mission Bay Cumulative Scenario in 2015 the project would contribute to deterioration to LOS F of one more arterial (see Table I.B.2c).

Intersections (See pp. IV.144 - IV.172)

Impacts were analyzed at 63 intersections in the vicinity of the proposed ballpark for the four times before and after games chosen for analysis. In addition, two intersections near 3Com Park, where the Giants now play—Third Street at Jamestown Avenue, and Third Street at Cesar Chavez Street—and the intersection at Broadway and The Embarcadero, were analyzed, for a total of 66 intersections. Prior to adding ballpark-related traffic to local intersections, existing traffic was redistributed to account for the effects of roadway improvements that are now under construction, such as the King Street on- and off-ramps to I-280.

The greatest impact from project-related traffic would occur after some or all of the afternoon games or events (see Table I.B.4a). During the 3:30 - 4:30 p.m. time period, 10 of the 66 intersections currently operate at LOS E or F. The level of service at 19 more of the 66 intersections would deteriorate to LOS E or F with the project traffic added. Because 2 of the 19 would already be at LOS E and would decline to LOS F with the project, a total of 27 intersections would be at LOS E or F after weekday afternoon games with the project.

TABLE I.B.4
SUMMARY OF INTERSECTION IMPACTS

a. PROJECT IMPACTS		b. CUMULATIVE-PLUS-PROJECT		c. UCSF/MISSION BAY CUMULATIVE SCENARIO-PLUS-PROJECT	
# of Intersections at LOS E or F		**# of Intersections at LOS E or F**		**# of Intersections at LOS E or F**	
Weekday Afternoon Post-Game 3:30 - 4:30 p.m. *(66 intersections analyzed)*		***Weekday Afternoon Post-Game 3:30 - 4:30 p.m.*** *(66 intersections analyzed)*		***Weekday Afternoon Post-Game 3:30 - 4:30 p.m.*** *(66 intersections analyzed)*	
Existing	10	Existing + Project	27	Cumulative + Project	27
Existing + Project	27	Cumulative + Project	27[2]	UCSF/MB + Project	35
Weeknight Pre-game 6:30 - 7:30 p.m. *(66 intersections analyzed)*		***Weeknight Pre-game 6:30 - 7:30 p.m.*** *(66 intersections analyzed)*		***Weeknight Pre-game 6:30 - 7:30 p.m.*** *(66 intersections analyzed)*	
Existing	6	Existing + Project	21	Cumulative + Project	17
Existing + Project	21	Cumulative + Project	17[2]	UCSF/MB + Project	27
Weeknight Post-game 10:30 - 11:30 p.m. *(38 intersections analyzed)*[1]		***Weeknight Post-game 10:30 - 11:30 p.m.*** *(38 intersections analyzed)*[1]		***Weeknight Post-game 10:30 - 11:30 p.m.*** *(42 intersections analyzed)*[1]	
Existing	0	Existing + Project	5	Cumulative + Project	3
Existing + Project	5	Cumulative + Project	3[2]	UCSF/MB + Project	3
Weekend Day Game 4:00 - 5:00 p.m. *(38 intersections analyzed)*[1]		***Weekend Day Game 4:00 - 5:00 p.m.*** *(38 intersections analyzed)*[1]		***Weekend Day Game 4:00 - 5:00 p.m.*** *(42 intersections analyzed)*[1]	
Existing	0	Existing + Project	9	Cumulative + Project	11
Existing + Project	9	Cumulative + Project	11[2]	UCSF/MB + Project	12

Notes:

1. Fewer intersections were analyzed after weekday night games and after weekend games because there is less congestion from existing traffic at those times.
2. It is assumed that the City would optimize signal timing at congested intersections in the future when daily traffic increases call for improvements. Therefore, some cumulative-plus-project intersections would improve, resulting in fewer intersections at LOS E or F in some cases, despite overall increases in traffic.

Nine of the impacted intersections are along Third Street because a substantial number of cars would leave the ballpark area in both the northbound and southbound directions. Intersections near the I-80 ramps on Harrison and Bryant Streets also would be impacted.

Before weekday night games, 6 of the 66 intersections already operate at LOS E or F because of afternoon commute traffic; project traffic would cause an additional 17 intersections to decline to LOS E or LOS F during the 6:30 to 7:30 p.m. period (see Table I.B.4a). Two would decline from LOS E to F for a total of 21 intersections at LOS E or F before weekday night games. During this time, the impacted intersections would be clustered along Fourth Street, a major access route to dedicated ballpark parking south of the Channel.

Fewer intersections were analyzed for the time periods after weekday night games (10:30 - 11:30 p.m.) and after weekend day games (4:00 - 5:00 p.m.) because existing conditions are better at all intersections during these times, and ballpark traffic would cause significant impacts at fewer locations. All 38 of the study intersections analyzed during the 10:30 to 11:30 p.m. weekday night time period currently operate at LOS B or better (see Table I.B.4a). After a weekday night game, five intersections would decline to LOS E or F. The duration of congestion, however, would be shorter than during weekday afternoons because there would be less background, commuter traffic. After a weekend afternoon game, project traffic would cause nine intersections to decline to LOS E or F.

The intersection and arterial analyses assume that the Lefty O'Doul and Peter Maloney bridges would not be lifted for boat traffic during the peak traffic times before and after baseball games. If the Lefty O'Doul Bridge at Third Street were to close for five to seven minutes to permit one boat to pass during the hour after a weekday afternoon ballgame, more than 15 additional minutes would be needed for ballpark traffic to dissipate and ballpark traffic could blend with p.m. peak hour commute traffic, causing further delays.

Cumulative-plus-project impacts in the year 2015 were calculated for all 66 intersections, assuming that the City would optimize signal timing at intersections where possible (see Table I.B.4b). The MUNI Third Street Light Rail (Third Street LRT) was assumed to be in place operating one-way northbound on Third Street and one-way southbound on Fourth Street south of King Street to the Fourth/Third intersection, with two-way operation for the remainder of Third Street south to Visitacion Valley.

The greatest impact from project-related traffic under cumulative conditions would occur after a weekday afternoon game. During the 3:30 to 4:30 p.m. time period an additional six intersections would deteriorate to LOS E or F compared to the existing-plus-project conditions, one of which would already be at LOS E (see Table I.B.3b). Five intersections would improve from LOS E or F to LOS D or better as a result of signal timing adjustments.

Therefore, a total of 27 intersections would be at LOS E or F at this time under cumulative-plus-project conditions. During the evening pre-game period (6:30-7:30 p.m.), the ballpark-plus-cumulative traffic would cause three more intersections to decline to LOS E or F and seven would improve to LOS D or better, compared to existing-plus-project conditions; a total of 17 intersections would operate below LOS D. After a weekday night game between about 10:30 and 11:30 p.m., no additional intersections would deteriorate to LOS E or F, and two would improve to LOS D or better compared with existing-plus-project conditions. After a weekend afternoon game four more intersections would decline to LOS E or F (one of which would decline from E to F), and one would improve to LOS D or better, for a total of 11 intersections operating below LOS D in the cumulative-plus-project scenario in 2015.

The UCSF/Mission Bay Cumulative Scenario in 2015, including the project traffic, would cause further deterioration in intersection LOS at most time periods (see Table I.B.4c). A total of 35 intersections would be at LOS E or F in the hour following a weekday afternoon ballgame (3:30 - 4:30 p.m.), eight of which would decline to LOS E or F as a result of the UCSF/Mission Bay cumulative development, with a ninth declining from LOS E to F.

Before weekday night games, an additional 10 intersections would decline to LOS E or F compared to the base cumulative-plus-project conditions, for a total of 27 intersections below LOS D. After weekday night games, three intersections would remain LOS E or F, as with the base cumulative-plus-project conditions; no more intersections would decline below LOS D as a result of the UCSF/Mission Bay Cumulative Scenario. During the hour after weekend afternoon games, UCSF/Mission Bay cumulative-plus-project traffic would cause three additional intersections to deteriorate to LOS F compared to the base cumulative-plus-project analysis (two of the three would already be at LOS E in the base Cumulative Scenario).

During the non-game day period, p.m. peak hour traffic from project employees and visitors on the site would cause one additional intersection to deteriorate to LOS F, at Harrison Street and The Embarcadero. Cumulative-plus-project traffic in the year 2015 would result in 10 of the 66 intersections degrading to LOS E or F, for a total of 22 intersections operating below LOS D. The UCSF/Mission Bay Cumulative Scenario would cause an additional 15 intersections to decline to LOS E or F, for a total of 35 intersections operating below LOS D in 2015.

Transit Impacts (See pp. IV.172 - IV.200)

The ballpark project would impact local transit service (the San Francisco Municipal Railway—MUNI) as well as regional services. Project impacts on MUNI would have two components: first, an incremental impact on passenger loads on existing MUNI bus lines, measured at the maximum load points; and second, a demand for a new shuttle service between the ballpark and Market Street, including both the MUNI Metro Extension (MMX) that is now under construction and a "bus bridge" replacing the existing Ballpark Express bus service to 3Com Park. For the impacts analysis, no change was assumed in the MUNI fleet size. Existing passenger loading data on MUNI is not available for all analysis times

used in the ballpark traffic analysis. Therefore, the ballpark patronage was added to existing p.m. peak hour MUNI loads and was compared with peak hour capacities, a conservative approach that probably overstates impacts. MUNI capacities were established for bus routes grouped by corridors, called "screenlines," based on their general destination from the downtown area to northeast, northwest, southwest, southeast and South of Market areas of the City.

Adding ballpark-related travel to existing p.m. peak hour MUNI loads, none of the screenlines would exceed their total capacity, although some lines within a corridor could exceed their individual capacity. The year 2015 cumulative analysis assumed that the MUNI Third Street LRT would be in operation extending south from King Street to the Bayview-Hunters Point community. The combination of cumulative growth in transit demand plus ballpark-related transit demand would cause two bus lines and four MUNI Metro lines to exceed maximum load standards, necessitating additional transit vehicle trips on these lines. Transit use at the South of Market screenline and the northwest screenline would exceed 90 percent of available capacity. Under the UCSF/Mission Bay Cumulative Scenario, transit demand would exceed the capacity of the South of Market screenline and the northwest screenline, and would cause three bus lines and four MUNI Metro lines to exceed maximum load standards. Demand from the UCSF/Mission Bay cumulative development plus ballpark-related travel on the Third Street LRT would exceed planned levels of service on this new line.

The greatest demand for transit service would occur between the ballpark site and Market Street, connecting with other MUNI lines and with regional transit services. This ballpark-to-Market Street service is proposed to be provided by the MUNI Metro Extension and a bus bridge that would use Second Street southbound and Third Street northbound, with no stops between Market Street and the ballpark. The bus bridge is projected to need between 13 and 23 standard 40-foot buses; the greatest demand would be during the 3:30 to 4:30 p.m. weekday afternoon period, when 23 buses would be needed. This exceeds the number of

buses MUNI currently uses in weekday post-game ballpark service (17) and occurs at a time when peak MUNI fleet deployment is beginning to serve the weekday afternoon commute. Therefore, when weekday afternoon games or other events occur, regular commute service on some lines might be somewhat delayed. For the MUNI Metro Extension, four to six 4-car trains would be needed, depending on the time period. Although Metro cars would be available to provide this additional service, the MMX is planned to use 1-car trains for regular service; 4-car trains could need additional funding to cover operating costs.

On non-game days, the project would generate transit demand during the p.m. peak hour; the additional ridership would not cause significant impacts on MUNI operating conditions.

Regional transit service demand caused by baseball game travel would affect BART to the East Bay and CalTrain to the Peninsula. Estimated peak hour ballpark use of BART would range from 330 passengers after a weekend day game to 1,680 passengers in the peak direction following a weekday afternoon game, creating a need for 2 to 12 additional BART cars. BART could add cars to some trains and/or add trains during the 3:30 to 4:30 p.m. weekday afternoon and the 4:00 to 5:00 p.m. weekend afternoon periods to accommodate this demand. Before and after all ballgames, CalTrain would need to add cars to existing trains in order to accommodate added demand. The last scheduled train on weekday nights leaves San Francisco at 10:00 p.m.; the Joint Powers Board has indicated that additional service could be provided after the end of weekday night games. Impacts on Golden Gate Transit, SamTrans, AC Transit and Amtrak are projected to be minor.

Parking Issues (See pp. IV.201 - IV.215)

A 15-minute walk from the ballpark was established as a reasonable distance to assume that most fans would be willing to walk for parking. The project would provide approximately 5,000 dedicated parking spaces south of China Basin Channel on the east and west sides of Third Street in the Mission Bay planning area for ballpark fans, game day employees, and concessionaires. In addition, about 180 parking spaces would be provided within the ballpark site for the Giants team and employees on the site. Parking spaces available in the north-of-Channel area within a 15-minute walk zone were inventoried to determine the number of spaces in the area and the number of unoccupied spaces that would be available for Giants fans during the analysis time periods.

Including employees and fans, the project would generate a demand for about 8,530 parking spaces during weekday games, 10,590 spaces during weekday night games, and 10,905 spaces during weekend games. The project would displace about 270 cars from the existing on-site parking lot. These cars would reduce the available supply in the ballpark area during weekdays.

During weekday afternoon games, there would be a shortfall of approximately 2,580 parking spaces within a 15-minute walk of the ballpark, in the parking study area, assuming sell-out crowds. An additional, less detailed inventory also was done of available parking beyond the 15-minute walk zone, within a 15 minute to approximately 20-minute walk of the ballpark. On weekday afternoons, an estimated 3,080 public, off-street parking spaces could be available in this 15- to 20+ minute walk area to serve ballgame attendees who could not find parking either in the Giants' dedicated parking areas or within 15 minutes of the ballpark site. These spaces would be enough to satisfy the 2,580-space shortfall if fans were willing to walk greater distances.

During weekday night games sufficient parking would be available in public and private lots and on-street within a 15-minute walk of the ballpark to satisfy the ballpark parking demand. During weekend afternoon games, on Saturdays, when more parking is occupied by shoppers and visitors, there would be a small surplus of parking spaces within a 15-minute walk of the ballpark site, but parking within this area would be essentially at capacity. Therefore, some ballpark fans would be likely to park within the 15- to 20+-minute walk zone. On Sunday afternoons parking is more available in the north-of-Channel area, so fans would be less likely to use parking outside the 15-minute walk area.

Under cumulative conditions in the year 2015, some parking spaces available when the ballpark opens in 2000 would be eliminated by development in the area. Therefore, parking shortfalls during weekday afternoon games would be greater and would fully use parking available within a 15 to 20+ minute walk of the ballpark in the north-of-Channel area south of Mission Street. Weekday night game attendees would be able to find parking within a 15-minute walk of the ballpark, although some fans might find it easier to park further away and walk 20 minutes to the ballpark. Parking for Saturday afternoon games would completely fill available spaces within the 15-minute walk zone, with some fans parking beyond this distance in the north-of-Channel area. However, on weekend game days, particularly Saturdays, parking supply in the South of Market area could be constrained further when other popular events (e.g., a weekend exhibit at the Moscone Center or Museum of Modern Art) are held.

Because of the development plans south of the Channel, it was not assumed that this area would provide substantial amounts of parking other than that proposed in the project. If development were to occur in that area as projected in the UCSF/Mission Bay Cumulative Scenario, additional parking spaces would be constructed; however, these spaces would be expected to be filled by employees and residents of the new development. It is possible that employee parking could be made available during weekday nights and weekend days, but the analysis is conservative and does not include these potential parking spaces. The Potrero

Hill area is beyond a 20-minute walking distance from the ballpark and has no direct transit service from the residential areas to the ballpark site. Parking would be available either in the Giants dedicated parking lots or within about a 20-minute walk from the ballpark in the South of Market area north of the Channel. Therefore, it can be expected that relatively little parking would occur on Potrero Hill by ballpark fans. The South Beach neighborhood, immediately adjacent to the ballpark site, would be used by Giants fans for parking. South Beach residents who rely upon on-street parking would compete with Giants fans for available parking spaces on game days, as would users of recreational facilities, business and industries located along Terry A. Francois Boulevard.

Pedestrian/Bicycle Impacts (See pp. IV.215a - IV.224)

The pedestrian forecasts include all fans, regardless of primary travel mode, because virtually all fans would be pedestrians for the last few blocks of their trip to and from the ballpark. Fans parking in the dedicated parking lot south of the Channel, including fans arriving by charter bus, would cross the Lefty O'Doul Bridge to access the ballpark. Serious pedestrian capacity deficiencies would exist on this Bridge, when as many as 14,500 pedestrians would need to cross the China Basin Channel at either Third Street or Fourth Street. Pedestrians would spill over into the traffic lanes on the bridge, resulting in pedestrian hazards, possible interference with transit service, and worsening of traffic conditions. Mitigation measures include closing the bridge to vehicular traffic before and after ballgames to provide space for pedestrians, bicycles and transit (see p. I.48).

Pedestrian deficiencies would exist on the Third Street sidewalks north of the Lefty O'Doul Bridge, on the sidewalk on the south side of King Street along the ballpark frontage between Second and Third Streets, and in the crosswalks on the south side of King at Third Street and on the west side of Second at King Street. The MMX and MUNI buses from the bus bridge would load and unload passengers in the ballpark area on the north side of King Street

between Second and Third Streets. The number of passengers would overwhelm the MMX platform as fans attempted to use the system after a ballgame and would spill into the street at the platform and in crossing to the north side of King Street for the bus bridge. Mitigation measures include closing King Street between Second and Third Street before and after ballgames (see p. I.48). On Market Street after a ballgame the number of pedestrians exiting the bus bridge would impact traffic and pedestrian circulation in the vicinity of the BART entrance between New Montgomery and Third Streets.

- It is estimated that up to 475 persons would bicycle to and from ballgames. Primary bicycle access routes would be Second and Fifth Streets and The Embarcadero from the north, Third
- Street from the south and Townsend Street or Sixteenth Street from the west. The project sponsor would consider providing 250 secure spaces with overflow parking for 200 to 300 more bicycles as needed.

Freight and Delivery Service (See pp. IV.224 - IV.228)

The project includes seven loading docks for large trucks under the left-field bleacher seating. Large truck loading and unloading generally would not be expected on a game day, to avoid conflicts with pedestrians at the ballpark, as is the case at 3Com Park, except for media trucks and special promotion-day merchandise trucks, which typically arrive and depart after peak ballpark traffic periods.

As proposed, the project would include an adequate number of loading spaces for peak hour delivery and service vehicles and would meet Planning Code loading requirements. However, the Pavilion Building would not have space for large trucks; therefore goods would need to be moved a long distance to and from the ballpark loading area on the east side of the site. Loading operations would need to be monitored strictly to discourage large trucks from parking on Third Street for deliveries to the Pavilion Building.

NOISE

The noise analysis for the project considers both increases in noise from ballpark traffic and increases in noise from crowds at the ballpark during ballgames. Representative residential and institutional receptor sites were selected from the traffic study area for the traffic noise study. The section also discusses noise impacts of both a large, open-air concert at the ballpark with amplified music and crowds of up to 50,000 people, and noise from a small music event held in a portion of the ballpark enclosed by a fabric canopy. Crowd and concert noise was analyzed for representative residential locations adjacent to and near the ballpark site and for a representative location on Potrero Hill.

Traffic Noise

Traffic noise changes at residential locations studied, while small, could add to the level of annoyance of some residents if they live in older structures that may not include sufficient noise insulation. With project traffic, and with cumulative-plus-project traffic, the vicinity of St. Gregory's Church at Mariposa and De Haro Streets on Potrero Hill would experience a noise increase before a weekday night game (6:30 p.m. to 7:30 p.m.) that would be noticeable to most people in the area and annoying to some churchgoers. As the increase would last about one hour during the peak travel time before a ballgame or other capacity event, the increase would be unlikely to meaningfully or substantially impact the usefulness of the facility.

A second cumulative scenario, accounting for growth from full development of the Mission Bay area south of China Basin Channel, including a new University of California at San Francisco campus (UCSF/Mission Bay cumulative scenario), was also analyzed for traffic noise increases. Growth from the UCSF/Mission Bay cumulative scenario plus project traffic would not cause traffic-noise increases in the area north of China Basin Channel large

enough to produce perceptible noise increases compared to those shown for the "base" cumulative-plus-project analysis. However, growth from the UCSF/Mission Bay cumulative scenario would cause a near doubling of loudness compared to existing ambient outdoor noise levels in the Mariposa/De Haro Streets area. Therefore, cumulative development in the UCSF/Mission Bay cumulative scenario, including ballpark traffic, would have a significant cumulative noise impact.

Ballgame Crowd Noise

Crowd noise from ballgames was modeled based on measurements taken at and near 3Com Park during a baseball game in 1996. Six residential locations near the ballpark site, and one on Potrero Hill, were studied to determine the change in the outdoor noise that would result from a sell-out crowd at the China Basin ballpark. At most locations, noise would not differ substantially from existing noise levels. However, at the approved apartment building to be located across King Street from the proposed ballpark at Second and King Streets, upper floors with a direct view of the ballpark interior would experience a noise increase of about 3 dBA compared to existing noise levels. For short periods, the projected maximum crowd noise levels from cheers and applause would be substantially higher (3 to 11 dBA) than the existing ambient noise levels outside the upper floors of nearby apartment buildings that face the ballpark and that have views of the interior of the ballpark. At these locations, the cheering noise from fans should be very noticeable when the listener is outdoors (on a deck) or has windows open, especially during lulls in traffic. Some listeners could find these cheering noises and crowd noise annoying; others might enjoy hearing occasional cheers from the ballpark. For this reason, and because of the duration and occasional nature of the crowd noise, and the urban setting of the ballpark, the introduction of crowd noise to the area would not be considered a significant impact.

Amplified Music Noise

Noise levels from a full-capacity open-air concert with amplified music, were analyzed to assess maximum reasonable noise generation from the site. These noise impacts would be greater than crowd noise from a baseball game. Music would be the dominant influence on the noise environment, with occasional interruption by crowd cheers and applause. Noise levels with music and crowd cheering added to existing ambient noise levels would be about 1 or 2 decibels higher than the existing level at most locations. On the top floor of the existing South Beach Marina Apartments at Townsend and Colin P. Kelly, Jr. Streets and at the upper floors of the approved apartment building at King and Second Streets, the noise increase would be 7 to 8 decibels, due largely to music. At the south edge of the Steamboat Point Apartments on King Street, noise levels could range from 12 to 17 decibels above ambient levels, depending on the placement of speakers. For short periods, the projected maximum noise levels, due to crowd cheers and music crescendos, could be 6 to 14 dBA louder than ambient levels at many locations and would be distinctly audible at upper stories of nearby apartment buildings, especially during lulls in traffic on King Street. Music sound has a different quality than traffic noise and other common urban sounds. Therefore, music would be audible at most of the residential locations studied, although ambient noise levels at these locations would not change substantially. The change in noise levels at the approved apartment building across King Street from the ballpark site would occur for a few hours during amplified music events.

A smaller concert with an attendance of about 10,000 persons, under a fabric canopy, was also studied. It would not be as loud as the full-capacity event described above. Both the hourly average noise and the maximum noise due to music and crowds would be less than the existing outdoor ambient noise levels at all locations studied, except at the approved apartment building across King Street from the ballpark site, where music and crowd noise would be noticeable but would not be significant. Ballgames and other major events at the ballpark could attract small planes with advertising banners, similar to those that now fly over 3Com Park and other similar sites. The resultant noise is considered a temporary nuisance rather than a significant environmental impact.

Construction Noise

- Construction noise would be temporary, occurring during the 24 to 27 months of construction activity. Noise from pile driving would exceed 85 dBA at the closest residential receptors; normal conversation is extremely difficult and sleep is impossible for most people at this noise level. Pile driving would occur during weekdays and occasionally on weekends for about five or six months.

AIR QUALITY

Regional air emissions from the project's traffic were compared with emissions calculated for existing traffic from ballgames at 3Com Park at Candlestick Point, because the proposed project would not be an entirely new use in the region, but primarily would move an existing use to a new location. Regional emissions were calculated for ballpark traffic alone, for the site's other land uses (restaurant, retail, office and commercial uses) alone, and combined to compare with existing emissions from 3Com Park.

The air pollutant emissions from motor vehicles associated with the proposed ballpark alone would either be less than emissions from ballgame traffic at 3Com Park, or if more, would not exceed the 80 lb/day BAAQMD threshold for criteria pollutants. With traffic from both the ballpark and the site's other land uses, there would be net increases in reactive organic gases (ROG), nitrogen oxide (NO_x), and small-diameter particulate (PM_{10}) daily emissions from motor vehicles: 64 lbs, 101 lbs, 15 lbs, respectively, in the year 2000; 15 lbs, 82 lbs, and 12 lbs, respectively, in the year 2015. These projected amounts are in addition to expected emissions from current conditions at 3Com Park. The project's vehicular NO_x emission increment would exceed the 80 lb/day Bay Area Air Quality Management District (BAAQMD) threshold.

Six representative intersections and sites near six sensitive land uses were analyzed for localized carbon monoxide (CO) emissions from project-related traffic. In the year 2000, violations of the State one-hour and State and federal eight-hour CO standards are anticipated at five of the six modeled intersections, the one exception being at Fourth and Townsend. Three of the six modeled sensitive land use receptors would experience violations of the State and federal eight-hour CO standards, specifically the school on Harrison Street west of Fourth Street, the residential units on Third Street north of South Park Drive, and the hotel at Bryant and Fourth Streets (the latter would violate the State one-hour CO standard as well). By the year 2015, however, no violations of the State or federal CO standards would be expected at any of the modeled receptors because project-related adverse effects on CO levels would be offset by the stringent vehicular CO emission controls expected to be implemented over the next 20 years.

The BAAQMD does not consider construction emissions of CO and ozone precursors significant because they have already been included in the District's regional planning inventories and are not expected to impede regional attainment or maintenance of air quality standards. The EIR followed BAAQMD recommendations in developing a comprehensive set of PM_{10} control measures to assure that PM_{10} standards would not be violated locally during project construction phases.

SEISMICITY

The site of the proposed ballpark is a nearly level bayside location, underlain by 40 to 125 feet of fill, Bay Mud, and Old Bay Clay, which overlie shale bedrock. The groundwater table is between 1 and 12 feet below the ground surface.

The ballpark site is not in an Alquist-Priolo Earthquake Fault Zone, but is in a State Seismic Hazards Zone for Liquefaction and the City's Special Geologic Study Area for potential

ground failure hazards (liquefaction, lateral spreading) and potential inundation hazards (tsunami). The vicinity of the ballpark is susceptible to earthquake-related ground shaking that would be strong enough to damage buildings and infrastructure, and possibly result in loss of life.

The San Francisco Building Code would regulate seismically resistant construction design and excavation activities at the project site to reduce loss of life during earthquakes. Piles would be driven to depths between 40 and 80 feet to support the structural portions of the ballpark and reduce the effects of ground shaking. The playing field would be underlain by a strong polymer net (called a geogrid) to reduce the effects of seismically induced liquefaction. Detailed analysis of the supporting structures for the bulkhead and seawall would be conducted during the demolition phase of the project, and remedial measures applied to reduce the effects of seismically induced lateral spreading.

CONTAMINATION AND ENVIRONMENTAL RISK

Soils and groundwater at the ballpark site are known to have been contaminated by hazardous wastes from past land uses. Site investigations have detected chemicals in soil and groundwater at the project site; however, it is likely that not all of the chemicals are present at toxic concentrations. Results of the human health risk evaluation indicate that the presence of chemicals in soil, groundwater and ambient air (as dust or vapors) at the ballpark site is not expected to pose an unacceptable noncarcinogenic or carcinogenic risk to workers or visitors at the site, nearby residents or workers, or recreational users of San Francisco Bay.

During site development, construction workers could encounter other chemical hazards, for example, unanticipated hazardous chemicals or buried structures, that were not identified during the site characterization program. There also is a potential for encountering underground storage tanks (USTs) during excavation at various locations on the project site.

Such hazards would be addressed in a Site Health and Safety Plan prepared according to applicable laws and regulations. USTs, if encountered during site excavation, would be closed under the guidance of responsible regulatory agencies following applicable laws and regulations to minimize the potential for exposure.

The ballpark site is subject to the Maher Ordinance which requires building permit applicants proposing to disturb more than 50 cubic yards of soil eastward of the 1851 high tide line to conduct environmental assessments of that soil for possible hazardous waste. The site investigation and the *Soil Management Plan* prepared pursuant thereto meet the requirements as set forth in the Maher Ordinance. If more than 50 cubic yards of soil were disturbed for construction of the parking areas South of the Channel, requirements of the City's Maher Ordinance would need to be addressed prior to construction, which could include a site investigation of the site's soil and groundwater quality. Construction activity for the access driveway would be subject to the Site Mitigation Report prepared for the SFRA's South Beach Park extension project.

Buildings to be demolished at the project site are contaminated with asbestos, lead and polychlorinated biphenyls (PCBs). Exposure to these contaminants could cause adverse health impacts. These contaminants would be removed prior to demolition of the buildings in accordance with applicable regulations. There would be a potential for exposure during removal of these materials from the contaminated buildings. Potential for exposure would be minimized by following safety procedures as required by applicable laws and regulations.

WATER QUALITY AND AQUATIC ECOLOGY

Construction activities could increase turbidity in China Basin Channel temporarily, which could reduce photosynthesis by algae in the aquatic system, thereby adversely affect existing Pacific herring habitat. Turbidity also could result from fine construction debris and from pile-driving activities for the proposed infill pier that would connect the Port Walk along the Channel to The Embarcadero promenade (Herb Caen Way). Turbidity resulting from storm water runoff from the construction site would be controlled through the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which would be required by the Regional Water Quality Control Board, San Francisco Bay Region

(RWQCB). The SWPPP also would include management practices for other aspects of the construction site, such as spill containment and storage of hazardous materials.

Accumulation of contaminants in aquatic organisms could be caused by resuspending contaminated sediment at the bottom of the Channel. Resuspension would be caused by tugboats that would tow construction barges. Accumulation of contaminants also could result from toxic construction debris, from toxics that may be present in the Pier 46B discharge pipe that is proposed for removal, and from the zinc coating proposed for application on the Channel bulkhead.

Changes in groundwater hydrology may mobilize groundwater contaminants in the northern portion of the ballpark site. Groundwater hydrology could be altered because of the proposed closure and abandonment of the sewer in Berry Street, and the dewatering of the proposed batting cage area during excavation. The area of concentrated contaminants would be monitored during dewatering, as required by the RWQCB. If the RWQCB determines that the contamination is spreading, the RWQCB may impose several actions upon the project as described in IV.J. Water Quality and Aquatic Ecology, p. IV.322.

Changes in surface drainage which might otherwise be expected to affect overflows would be addressed by re-routing of sewer flows upstream of the ballpark site into a large-capacity box sewer in King Street. This re-routing would not substantially decrease sewer capacity in the local area and would not change the frequency of existing sewer back-ups in the South Beach Area.

Litter produced during games could enter China Basin Channel and could pose potential hazards to aquatic organisms.

The EIR contains mitigation measures to address potential impacts (see p. I.54).

GROWTH INDUCEMENT

This section evaluates whether the project and foreseeable activities fostered by the project might encourage other activities that would induce growth in employment or economic activity. Most game-day project jobs would be held by existing employees now holding similar positions for ballgames at 3Com Park. About 400 new year-round jobs would be provided by the proposed centerfield restaurants and uses in the Pavilion Building. The project would not directly induce population growth or demand for housing because new on-site employment would not increase substantially.

As part of the project, the Rincon Point - South Beach Redevelopment Plan Area would be expanded to include the site. Redevelopment of the ballpark site would continue and intensify the evolution under the Redevelopment Plan of a mixed commercial and residential neighborhood in South Beach.

The ballpark would add a regional special event center to the San Francisco waterfront, encouraging greater day and nighttime pedestrian activity in the area and generating demand for additional restaurants, bars and retail establishments north of China Basin Channel. Such demand could be substantial, encouraging new development and conversion of existing uses to retail, restaurants, sports lounges and bars. Thus, the ballpark could intensify the pace and change the type of future growth. A portion of the increased demand generated by the ballpark could be met by the regional commercial/entertainment center proposed near the site in Mission Bay and through development of Port property under the Port's *Draft Waterfront Land Use Plan*, if it is adopted. The Port could capitalize on the game and event day activity at the ballpark with its planned new development and public access improvements on Port property, increasing the potential for public use and enjoyment of the waterfront.

C. MITIGATION MEASURES

VISUAL QUALITY AND LIGHTING

Measure Not Included in the Project

The parking area lighting should be designed to minimize off-site glare.

TRANSPORTATION AND CIRCULATION

Measures Included in the Project

A "bus bridge" to shuttle fans between Market Street transit services and the ballpark, and four-car MUNI Metro Extension trains are assumed to be part of the transit service available before and after ballgames.

A Transportation Demand Management plan for employees and concessionaires is included as part of the project.

A Motorist Information System, which could include use of existing radio stations and/or Bay Area Travinfo to provide travelers with real-time information about traffic, parking and transit before and after ballgames, is planned to be part of the project.

Measures Under Consideration or Outside Project Sponsor's Control

Traffic Mitigation Measures

Ballpark Transportation Coordinating Committee

A Ballpark Transportation Coordinating Committee should be established to implement and monitor the transporation mitigation program. It should include representatives of appropriate City agencies, such as the Department of Parking and Traffic, the Municipal Railway, the Police Department, the Planning Department, CalTrain, BART, and ferry service operators, as well as representatives from the project sponsor. The committee also could include representatives of neighborhood, special interest, and property owner groups. The committee would aid in establishing traffic routing plans and encouraging transit use and could aid in revising traffic mitigation based on experience with implementation.

Traffic Routing Plan

A traffic routing plan to detour non-ballpark traffic around the ballpark area, to direct ballpark-bound vehicles to appropriate parking lot entrances, and to discourage traffic intrusion into residential areas, would reduce traffic congestion in the areas near the ballpark. The plan should be flexible enough to respond to changes in conditions, over time, as well as to changes based on experience with varying sizes of crowds attending ballgames. The plan should include the following, among other features:

- A detour for non-ballpark traffic around the Third and Fourth Street parking areas south of the Channel and the Lefty O'Doul Bridge, and away from the pedestrian/transit area on King Street between Second and Third Streets. King Street between Second and Third Streets and the Lefty O'Doul Bridge should be closed to private vehicular traffic. The remainder of Third Street between Sixteenth and King Streets should be limited to local traffic accessing either dedicated Giants parking or uses located on Third Street.

- One-way traffic on the Peter Maloney Bridge and related portions of Fourth Street leading southbound, toward dedicated parking before ballgames, and northbound, away from parking after games.
- Use of Parking Control Officers (PCOs) stationed at key intersections to direct non-ballpark traffic away from the Giants dedicated parking areas and the closed King Street block, to discourage drivers from using the residential block of Brannan Street between The Embarcadero and Colin P. Kelly Jr. Street, and to assist with traffic flows along the detour routes. PCOs would also assist drivers needing access to land uses along closed portions of Third and Fourth Streets south of the Channel and Third and Second Streets adjacent to the ballpark.
- Use of guide signs on freeways and local streets to direct ballpark traffic to dedicated parking lots and to direct non-ballpark traffic around the area to the Sixth Street exit from I-280 or to local streets using the marked detour.

A preliminary traffic routing plan is described and analyzed in the EIR. The detours and street closures proposed in this preliminary traffic routing plan would result in improvement in levels of service (LOS) at about six intersections near the ballpark site, and would cause deterioration in LOS to unacceptable levels at 11 intersections along the detour route after a weekday afternoon game. Similar results would occur at other times before and after ballgames. Overall, the preliminary plan tends to result in a net increase in the number of intersections at LOS E or F because the routing plan disperses traffic over a larger area; however, the plan would prevent severe congestion that otherwise would occur at intersections near the ballpark and the dedicated parking areas.

Temporary and permanent measures could be instituted to reduce the impacts of the preliminary traffic routing plan. If all measures suggested in the EIR were included, most intersections would return to acceptable LOS ("D" or better). These measures could include:

- position PCOs at busy intersections to monitor and direct traffic, providing priority to buses, shuttles, and emergency vehicles;
- develop a special, temporary signal timing plan for appropriate intersections before and after ballgames;
- install traffic cones and temporary signs at intersections where special lane arrangements would improve traffic flow before and after ballgames;

- place a temporary "Local Traffic Only" sign on Sixth Street at its intersection with Sixteenth Street to discourage attempts to bypass the Third Street detour;
- reevaluate permanent signal timing at selected intersections;
- restripe Terry A. Francois Street between Mariposa Street and dedicated parking lot entrances to provide four travel lanes, and provide a "keep clear" pavement marking opposite the Pier 52 boat launch ramp;
- restripe portions of Townsend Street to provide two travel lanes and increase capacity; and
- restripe and repair Seventh Street to improve traffic capacity.

Additional Transit Services

Providing additional transit services for people traveling to/from the ballpark would help to reduce automobile traffic. Ferry service directly to the ballpark, using a floating dock on the north side of China Basin Channel near the ballpark Port Walk, is under consideration. Extra CalTrain service before and after ballgames, including a special train to serve fans following weekday night games (included in the transportation analysis on p. IV.196), is under consideration, based on a resolution adopted in November 1996 by the Peninsula Joint Powers Board supporting provision of such service.

Transit Incentive Program

A transit incentive program would encourage transit use and other alternative modes of travel to the ballpark. Examples of measures which could be included in such a program include:

- charging relatively high fees for parking in the dedicated parking lots;
- providing concession discounts for fans showing evidence of using transit to the ballpark; and
- providing transit schedule information in ticket packets, by recorded telephone messages, and on websites.

Public Information/Outreach Program

A public information and outreach program should be established. It could include measures such as:

- offering transit and parking passes when fans purchase tickets; and
- providing an information packet with travel options and transit schedules.

Transit Mitigation Measures

To facilitate pedestrian movement at the MMX stop in King Street opposite the ballpark and at the bus bridge stop on the north side of King Street, the street should be closed between Second and Third Streets for approximately one hour before and after games. Loading MMX cars from the street-side, with modifications to provide temporary steps up to the LRV entrance, would speed loading following ballgames. Collecting round-trip fares prior to ballgames and loading more than one bus at a time for the bus bridge trips back to Market Street after games also would help reduce the pedestrian crowds on sidewalks and in a closed King Street and increase the attractiveness of transit as an alternative to driving to the ballpark.

The proposed bus bridge mitigation measure would operate most effectively with transit-only lanes provided on Third Street after weekday afternoon games and before weekday night games, prohibiting parking on the east side of the street in order to create the exclusive lane.

Pedestrian Mitigation Measures

Pedestrian safety impacts on the Lefty O'Doul Bridge, and on Third Street and King Street sidewalks adjacent to the ballpark could be mitigated by:

- closure of Third Street to automobile traffic between Sixteenth and King Streets before and after ballgames except for cars destined for the dedicated ballpark parking lots south of the Channel;
- closure of King Street between Second and Third Streets to automobile traffic before and after ballgames;
- closure of the Lefty O'Doul Bridge to all but transit and pedestrian traffic before and after ballgames, or construction of a pedestrian-only bridge over China Basin Channel;
- changing signal timing temporarily at the intersections of King with Second and Third Streets to provide for more pedestrian green-time.

NOISE

Measure Included in the Project

Pile driving would be scheduled during the time of disturbance to the fewest people when feasible.

Measures Not Included in the Project

Concerts at the ballpark featuring live amplified music without limits on maximum noise levels should be limited to about five per year. Additional concerts would be restricted by a monitoring program to reduce their noise impacts outside the ballpark.

The contractor should be instructed to pre-drill holes for piles, if feasible based on soils, to the maximum feasible depth.

AIR QUALITY

Measures Included in the Project

During construction, the project sponsor would require a comprehensive sét of control measures to ensure that PM_{10} standards were met, including use of tarps, water spraying to settle dust, soil stabilizers, and pavement sweepers.

Measures Under Consideration

During ballpark operations, the use of public transit and other transportation management programs described in the transportation section would be encouraged to reduce auto trips to the site, thereby reducing emissions and improving air quality.

SEISMICITY

Measure Included in the Project

Ballpark emergency response plans, integrated with San Francisco's emergency response plans, would be designed specifically for the ballpark and implemented as part of the project.

WATER QUALITY AND AQUATIC ECOLOGY

Measures Included in the Project

To prevent turbidity and sediment resuspension caused by tugboat activity, the project sponsor would require the construction contractor to use shallow-draft tugboats, which would set the tugboat propellers farther away from the bottom of the Channel, and to operate the tugboats at minimum speeds. If tugboat use and submarine pile-driving for the new connecting pier are scheduled during the peak Pacific herring spawning season from December 1 to March 1, a biologist would be present to monitor whether spawning activities are occurring (see V.F. Water Quality and Aquatic Ecology, pp. V.66 - V.67, for further detail). A silt curtain for submarine pile-driving and bulk-head repair would be used to contain suspended sediments.

To prevent debris from falling into the Channel during bulkhead repairs, the project sponsor would require the construction contractor to use suspended or floating platforms covered with tarps and to use catch-nets. Potential toxics from removal of the Pier 46B discharge pipe from the bulkhead would be prevented from being accidentally discharged to the Channel by inspection and removal of toxic materials before each pipe is removed. Zinc particles generated during the application of zinc coating to the bulkhead would be prevented from entering the Channel by enclosing the working area with impervious material.

The project sponsor would prepare and implement a Storm Water Pollution Prevention Plan as required by the Regional Water Quality Control Board. During dewatering activities, the project sponsor would monitor the existing groundwater contamination conditions as required by the Regional Water Quality Control Board.

Measure Not Included in the Project

The amount of litter entering the Channel from waterfront areas associated with the ballpark would be reduced by the placement of trash receptacles, regular collection of trash, public education and noticing, and regular skimming of the surface of the Channel. Drainage improvements for the South of Channel parking areas would be designed so that storm water would be captured and conveyed for treatment.

CULTURAL RESOURCES

Measure Included in the Project

The project sponsor would retain the services of an archaeologist who would carry out a pre-excavation testing program to determine the probability of finding sub-surface cultural and historical remains. If, after testing, the archaeologist determines that further investigation is necessary, additional measures to be determined by the archaeologist and the Environmental Review Officer could include on-site monitoring of excavation and evaluation of any archaeological resources encountered.

D. VARIANTS TO THE PROPOSED PROJECT

This chapter evaluates three variants of the Giants ballpark project and, for each variant, provides a comparative analysis of potential environmental impacts. The variants selected for analysis are as follows:

- Ferry Variant - Under this variant, the project would include berthing facilities for ferry service at China Basin. This Variant could assist in reducing regional air pollution emissions to less-than-significant levels in the year 2015; and

- No Dedicated Parking Variant - Under this variant, the project would not include any dedicated parking south of China Basin Channel. This Variant would improve traffic levels of service at intersections on Third Street, Fourth Street and Mariposa Street near the ballpark site. This Variant could eliminate CO violations at Third and Bryant and Third and Townsend in the year 2000; however, some locations in areas north and west of the ballpark showing CO violations with the project could have slightly greater exceedances. As with the project, no CO violations are expected by the year 2015.

- Increased Dedicated Parking Variant - Under this variant, the project would include the dedicated parking south of China Basin Channel and approximately 1,800 additional dedicated parking spaces on Port land, including Pier 50, to a total of about 6,800 spaces south of the Channel. This Variant would foster increased traffic and associated vehicle emission impacts in the year 2000 and year 2015.

The Ferry Service Variant is also presented as a mitigation measure in Chapter V, pp. V.41 - 42.

E. ALTERNATIVES TO THE PROPOSED PROJECT

The Alternatives chapter evaluates two alternatives to the Giants ballpark project and, for each alternative, provides a comparative analysis of potential environmental impacts. The alternatives selected for analysis are as follows:

- No Project -- Continued Use of 3Com Park Alternative - Under this alternative, the project site would continue to be used for existing maritime and commercial uses and the Giants would continue operations at 3Com Park at Candlestick Point. The No Project Alternative is the environmentally superior alternative because it reduces all potentially significant effects of the project; and

- Reduced Project Alternative - Under this alternative, the project site would be developed with a baseball field, a seating bowl, and necessary baseball support services only. It would not include facilities for retail, commercial and restaurant uses that would operate year-round. The Reduced Project Alternative would avoid the project's exceedance of BAAQMD's significance threshold for nitrogen oxides (NO_x).

The City, in conjunction with the project sponsor, has evaluated alternate sites for a ballpark for over 30 years. A brief history of the other locations considered is presented in Section

C, Alternative Sites Considered and Rejected as Infeasible, with a brief explanation of the reasons underlying the determination in accordance with CEQA Guidelines 15126(d) and applicable case law.

The Reduced Project Alternative is the environmentally superior alternative other than the No Project Alternative.

F. AREAS OF CONTROVERSY

Although the voters of San Francisco endorsed the ballpark in the March 1996 election, there is oppositon to the ballpark based on environmental issues of traffic congestion, parking shortages, height and bulk, noise, and light and glare; on non-environmental policy issues such as the appropriateness of a non-maritime use in a waterfront location; and on non-environmental economic issues.

Other areas of controversy may arise as public hearings are held on the Draft EIR and project.

II. PROJECT DESCRIPTION

A. HISTORY AND BACKGROUND OF THE PROJECT

The San Francisco Giants major league baseball team (Giants) currently plays at 3Com Park at Candlestick Point (previously called Candlestick Park). Candlestick Park opened in April 1960 with approximately 42,500 seats for spectators. In 1971, the City and County of San Francisco expanded and reconfigured the stadium to accommodate the San Francisco 49ers football team. This raised the seating capacity to approximately 58,000. Over the next 25 years, the seating capacity was periodically increased to its current total of 70,000 to further accommodate the needs of the 49ers.

Since its opening, 3Com has been the subject of complaints about poor public transit access and weather. Most of the new seats added to accommodate the 49ers are not well-suited for baseball. Concourses, restrooms and other public areas are small and inadequate. Public transportation is limited to bus service and occasional ferry service. Weather conditions at 3Com Park are unfavorable. Prevailing conditions involve strong winds from the Pacific Ocean which carry moisture and cool temperatures. Analysis has indicated that 3Com Park's position next to Bayview Hill worsens wind conditions within the facility.

These unfavorable conditions resulted in a number of efforts to finance and construct a new ballpark in San Francisco. In the last decade San Francisco voters were presented with three different proposals for a new ballpark. In 1987, voters defeated a ballot measure to locate a ballpark at Seventh and Townsend Streets in San Francisco. In 1989, a second measure to build a ballpark at China Basin was defeated. The 1989 measure included public financial assistance.

Following the defeat of these two ballpark measures in San Francisco and two others in the South Bay, the team was sold to new owners. Under the direction of new ownership, the Giants are proposing to build a privately financed ballpark at China Basin. This is the subject of this Environmental Impact Report (EIR). The project was placed on the ballot as Proposition B by a majority of the Board of Supervisors and received voter approval in March of 1996. The measure amended Part II, Chapter II of the San Francisco Municipal Code (Planning Code), establishing development standards for a ballpark at China Basin. It also directed the City and County of San Francisco to adopt conforming amendments to its General Plan and other relevant plans and codes, and to request and apply for conforming amendments to all applicable state and regional plans and regulations. In addition, the measure created the Northeast China Basin Special Use District, adopted as Section 249.[18][1] of the Planning Code. Proposition B also amended Administrative Code Chapter 6 (Proposition H). Approvals and actions that would be needed to implement the project are discussed in II.F. Project Schedule, Cost, and Approval Requirements on pp. II.25 - II.30.

B. PROJECT SPONSOR'S OBJECTIVES

The Giants have created a new corporate affiliate, the China Basin Ballpark Company LLC (CBBC), for the purpose of developing a new ballpark at China Basin. The primary objective of the project sponsor is to construct a new ballpark that is easily accessible to downtown San Francisco. Another objective of the project sponsor is to construct a ballpark that provides comfortable conditions for fans and players, containing the amenities and attributes found in modern ballparks. The project architects have attempted to design a ballpark that takes advantage of its waterfront location and fits nicely within its urban context.

In establishing objectives for the project, the Giants have been influenced by the experiences of other cities that have recently built ballparks at locations and with designs often identified in concept as the urban model. These ballparks in Baltimore, Cleveland and Denver are located near downtown, depend on location to add to the attraction and convenience of

coming to games, rely on existing transit and parking facilities to a large extent and are designed to reflect the history of baseball architecture in the early part of this century.[2]

The Giants have identified several project objectives for securing a site and constructing a ballpark in San Francisco, using standards considered by them essential to the project's success:

- a ballpark of approximately 42,000 seats and associated facilities meeting major league standards for size and quality of improvements expected in modern ballparks;
- a site that is within walking distance of downtown San Francisco;
- a site that is readily accessible by public transportation, especially regional transit;
- a site that can be readily assembled and secured and enables the ballpark to be constructed within the budget and time schedule established for the project;
- a site that offers potential for using a high number of existing parking facilities (within a 15-minute walk) and offers the potential for dedicating 5,000-7,000 spaces for exclusive use by the ballpark;
- a site that possesses unique waterfront characteristics, making attendance at games an experience special to San Francisco;
- a site that can provide space for the construction of an ancillary building to include a children's learning center and other uses to be sponsored by Pacific Bell;
- the ability to use the ballpark's seating capacity for occasional major civic and entertainment events;
- the ability to convert the ballpark's infield area during the off-season to a small enclosed amphitheater with a capacity of 5,000 to 15,000 seats for music, concerts and entertainment;
- a site that can provide an appropriate context for designing a modern structure in the architectural tradition of old ballparks;
- a site that enables the project sponsor to implement the decision made by the City's electorate on March 26, 1996 to construct a ballpark on the proposed China Basin site; and
- the creation of a ballpark that will generate sufficient interest from fans and associated revenue sources to support private financing.

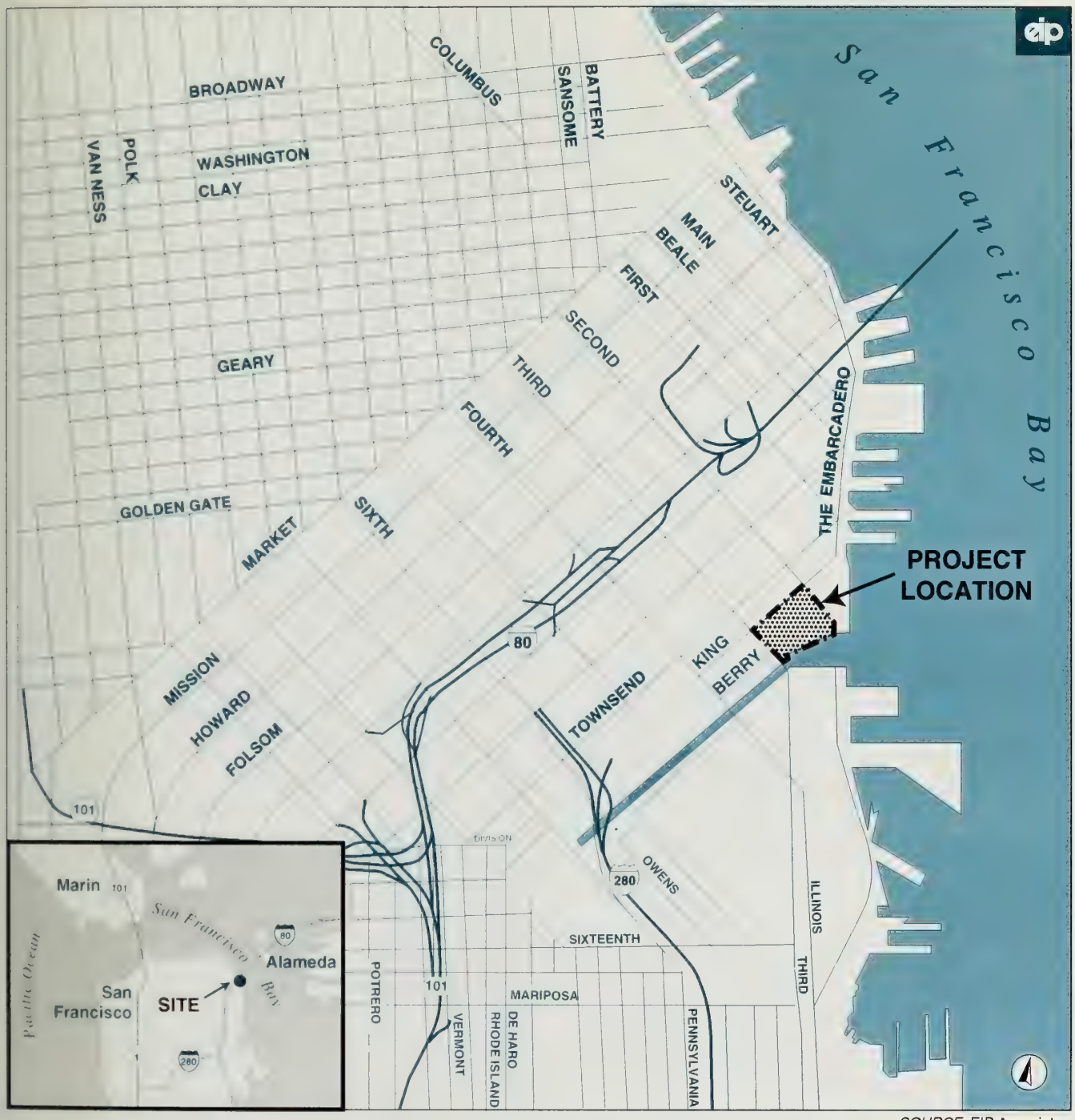
The lead project architect is Hellmuth, Obata & Kassabaum, Inc. (HOK Sport), the firm that has designed urban ballparks such as Baltimore's Camden Yards, Cleveland's Jacobs Field and Denver's Coors Field.

C. PROJECT SITE AND OWNERSHIP

The project site is adjacent to the San Francisco Bay (specifically China Basin), with its address on King Street near the South Beach area of San Francisco (see Figure II.C.1). The two-block site is bounded by King Street, Second Street, China Basin Channel and Third Street. Roughly trapezoidal in shape, the site measures approximately 740 feet (ft.) along Second Street, 905 ft. along King Street, 420 ft. along Third Street and 950 ft. along China Basin. The site includes the Second Street right-of-way to the northeast and the Berry Street right-of-way which bisects the site; it also includes Pier 46B which contains facilities used by the Port of San Francisco and its tenants. The total buildable area of the site is approximately 13 acres. The Lefty O'Doul Bridge is directly to the southwest of the project site on Third Street. South Beach Park and Marina are to the east of the project site (see Figure II.C.2, p. II.6). The site can be accessed via The Embarcadero, Third, Fourth, Berry and King Streets.

The California State Department of Transportation (Caltrans) owns the northerly block (Lots 3B, 26 and 27 on Assessor's Block 3794) of the site bounded by Second, King, Third and Berry Streets. This site was acquired by Caltrans in 1972 to allow for the extension of Interstate Highway 280. The Interstate 280 extension, however, was later abandoned. The Port of San Francisco is in the process of acquiring the Caltrans property.

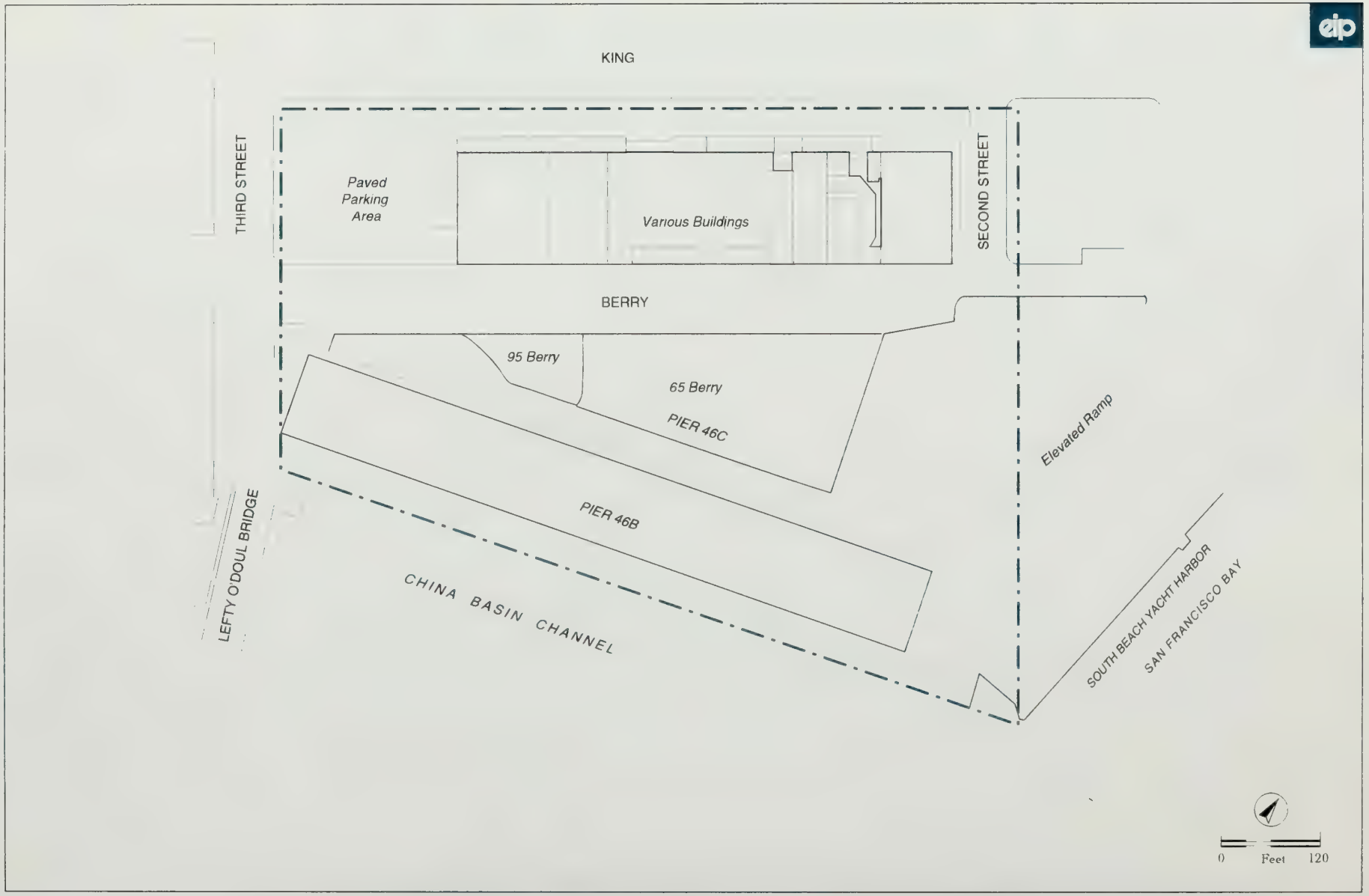
The City and County of San Francisco holds in trust the southeastern block (Piers 46B and 46C on Assessor's Block 9900) bounded by Second, Berry and Third Streets and China Basin. The Port of San Francisco has the authority to operate, maintain, regulate and improve the Bay properties of San Francisco that were transferred in trust to the City and County of San Francisco from the State of California through the Burton Act in 1968.



SOURCE: EIP Associates

GIANTS BALLPARK

Figure II.C.1 Project Location



SOURCE: Geomatrix Consultants, Incorporated, San Francisco, CA

GIANTS BALLPARK

Figure II.C.2 Existing Site

D. PROJECT CHARACTERISTICS

The proposed project includes the demolition, construction and redevelopment of the site described in II.C. Project Site and Ownership. The proposed project includes an amendment to the *Rincon Point-South Beach Redevelopment Plan* and the Design for Development document. This document provides specific design guidelines for development projects in the Rincon Point-South Beach Redevelopment Area. The Redevelopment Agency has initiated an amendment to the Redevelopment Plan that would:

1. Add the project area to the redevelopment plan area (legal description and maps).

2. Designate the ballpark site land use as "Ballpark."

3. Add appropriate definition of the ballpark use to the Project Plan and the Land Use Plan for the South Beach subarea. The amendment to the Project Plan (Section II.A) would add a new Objective 10 to allow the development of a major league ballpark in the South Beach subarea. The amendment to the Land Use Plan (Section II.B) would add a new Item 8 (ballpark), which would provide that the area designated for ballpark use would be developed with an open-air ballpark for major league baseball (maximum of 45,000 seats), with related commercial uses. It would also recognize that, pursuant to Proposition B, there is no minimum parking requirement.

The Design for Development document would also be amended to reflect the ballpark. Potential amendments include: clarify that there is no bulk limitation for the ballpark and that the light standards are exempt from the height limitation; reflect the parking provision from Proposition B (superseding City Planning Code Section 151); designate the ballpark as within the existing 40-160 ft. height district; include ballpark within project area boundaries; include the ballpark and related commercial uses as authorized uses at the project site; reflect street vacations for the ballpark; include signage guidelines; and provide a more-tailored program for submission and review of project plans and specifications.

The project also involves amendments to specific elements of the General Plan, as described in II.F., Project Schedule, Cost, and Approval Requirements. These amendments would be initiated by the City, pursuant to Proposition B.

Upon project completion, the two blocks would be redeveloped with an open-air, natural grass ballpark (see Figures II.D.1 and II.D.2). The ballpark would also include space for restaurant, retail and commercial uses. Pedestrian entrances would be at each corner of the ballpark, and three entrances would be adjoined by public plazas. A loading and service area as well as approximately 180 parking spaces would be developed under the ballpark structure in left to centerfield. Access to these facilities would be provided by a driveway situated parallel to the left-field wall. Additionally, there would be surface parking areas south of China Basin Channel consisting of approximately 5,000 spaces. This would be parking dedicated for ballpark use. This surface parking would be replaced by structured parking, as required, by the year 2015.

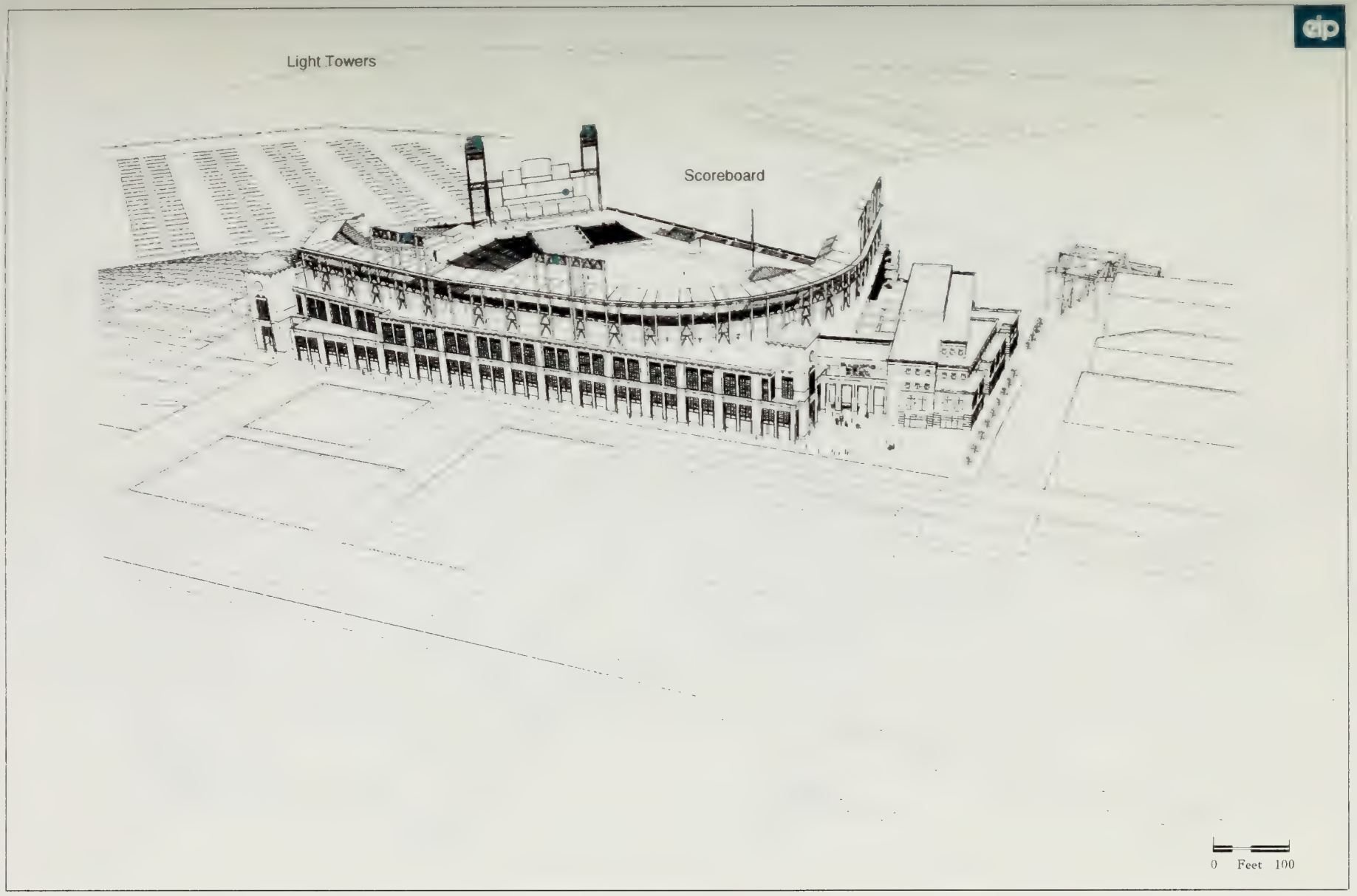
The project site is approximately 13 acres. At grade, approximately 355,000 sq. ft. of the site would be enclosed by the ballpark's structure. Another 132,000 sq. ft. of the site would be covered with the playing field. The ballpark's total gross floor area would be about 1,248,000 gross sq. ft., including 171,000 gross sq. ft. of commercial/Pavilion Building facilities and 1,077,000 gross sq. ft. of baseball uses.

The ballpark would include four major uses: baseball facilities, restaurant use, retail/ commercial and parking. Other uses are specified below (see Uses of the Ballpark subsection, pp. II.21 - II.22). Project components are described below and summarized in Table II.D.1, p. II.11.

BASEBALL FACILITIES

Playing Field

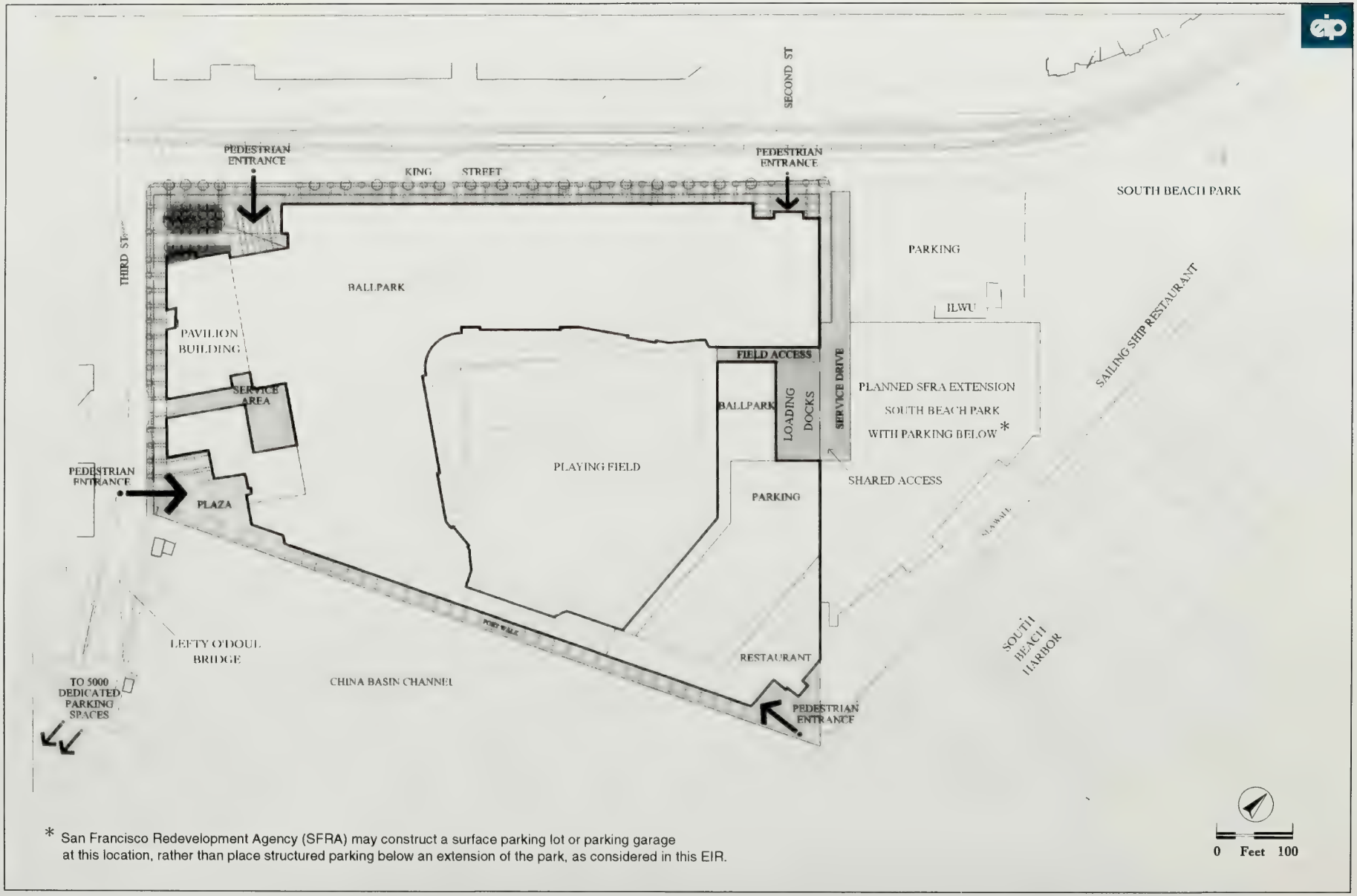
The ballpark structure would be oriented on the site so that the third-base line of the playing field would roughly parallel King Street. Home plate would face in an easterly direction. The left-field foul line would extend about 330 ft. from home plate to the left-field wall.



SOURCE: Hellmuth, Obata, & Kassabaum

GIANTS BALLPARK

● **Figure II.D.1 Aerial View of Proposed Ballpark Looking East**



* San Francisco Redevelopment Agency (SFRA) may construct a surface parking lot or parking garage at this location, rather than place structured parking below an extension of the park, as considered in this EIR.

SOURCE: Hellmuth, Obata, & Kassabaum

GIANTS BALLPARK

● Figure II.D.2 Site Plan for Proposed Project and Adjacent Area

TABLE II.D.1 ●
BALLPARK COMPONENTS

BASEBALL USES	AREA (sq. ft.)
Spectator Facilities	257,000
Spectator Seating (seats 42,000)	
Field Club Lounge	592,000
Club Level Lounge	
Concession Stands	
Novelties, Merchandise	
Security	
Restrooms	
First Aid, Fan Accommodation	
Concourses, Stairs, Ramps	
Clubhouses, Locker Rooms and Related Facilities	30,000
Home Baseball Clubhouse	
Visitor Baseball Clubhouse	
Auxiliary/Umpire's Locker Room	
Internal Batting and Pitching Tunnels	
Dugouts	
Family Waiting Room	
Administrative Facilities	40,000
Team Management	
Ticketing Offices	
Concessionaires Offices	
Reception	
Retail Offices	
Press Facilities	18,000
Writing Press, Work Rooms, Dark Rooms	
Broadcast Booths (T.V. and Radio)	
Camera Positions	
Scoreboard Operators	
Video Replay Studio	
Dining Facilities	
Interview Rooms	
Restrooms	

(page 1 of 2)

TABLE II.D.1 ●
BALLPARK COMPONENTS (cont.)

BASEBALL USES (cont.)		AREA (sq. ft.)
Stadium Service Facilities		85000
Guest Services Personnel		
Stadium Maintenance Shops		
Groundskeeper/Engineer Lockers		
Groundskeeper Storage and Office		
Material Storage		
Retail Operations Warehouse		
Food Service Operations, Commissary, Kitchens		
Mechanical/Electrical/Telephone Plant		
Loading Docks		
Trash Collection		
Parking		
Three Levels of Parking (180 spaces)		55,000
Subtotal of Baseball Uses		**1,077,000**
OTHER USES		
Commercial Facilities		35,000
Restaurant Use		
Pavilion Office Building		136,000
Ground Floor		
Retail Store	43,000	
Second Floor		
Pacific Bell Children's Learning Center/Communications Center	31,000	
Third Floor		
Broadcast Facilities/Studio	31,000	
Fourth Floor		
Giants Baseball Admin.	31,000	
Surface Parking		
25 - 30 spaces		
Subtotal of Other Uses		**171,000**
TOTAL AREA		**1,248,000**

Source: HOK Sports, Architects

The right-field foul line would extend about 310 ft. from home plate to the right-field wall. The centerfield dimension would measure about 400 ft. from home plate. The playing field would consist of natural grass. Figure II.D.2 is the site plan for the proposed project.

The bullpens used by pitchers would be located in foul territory beyond the dugouts along both foul lines. The home team dugout would be on the third-base side of the field.

Seating Bowl

The ballpark, as proposed, would have four levels of seating and an approximate building height of about 130 ft., with the top of the lighting structures rising to approximately 175 ft. The ballpark would provide various seating options at differing prices attractive to fans and at levels that meet the financial requirements of the project. The characteristics of the seating bowl of the facility are generally as follows:

- Upper Deck seating . . . . . 14,800 seats
- Lower Deck seating . . . . . 15,100 seats
- Bleacher seating . . . . . 5,900 seats
- Club Level seating . . . . . 5,300 seats
- Luxury Suite Level seating . . . . . 900 seats

Lighting/Scoreboard

The scoreboard system would include at least one scoreboard with full-color instant-replay video capabilities, matrix board/message boards, auxiliary and line scoreboards, exterior message center board and advertising panels and other signs. The primary scoreboard, located in centerfield, would be approximately 125 ft. above the playing surface at its highest

point with dimensions of 60 ft. high by 160 ft. wide. The scoreboard structure would contain a video and matrix board for message display. A smaller display board showing scores of other games would be located above the arches in the right-field wall.

The lighting plan for the ballpark calls for lighting banks at the structure's upper levels on standards approximately 175 ft. high. These banks would be designed to illuminate various zones on the playing field. The infield light banks would illuminate the pitcher-catcher zone, the infield zone and 20 rows of the patron areas between the dugouts. Mid-field light banks would illuminate locations along the first- and third-base lines in the area behind the infield and midway to the outfield walls. Outfield light standards would be located in centerfield and would illuminate the outfield and the remainder of the playing surface.

Team Facilities

The proposed ballpark would also include facilities related to the operation of the Giants' organization. Clubhouse locker rooms would be located at the field level. The clubhouse for the home team would consist of approximately 15,000 sq. ft., with the visiting team's clubhouse being approximately 6,000 sq. ft. An auxiliary locker room would be approximately 2,800 sq. ft. Some administrative facilities for team management would be provided at the street level. Appropriate telephone and television connections would be provided.

Press Facilities

Press facilities, including a working press room, dark room, broadcasting facilities, interview room, scoreboard operations room, dining facility, and restrooms, would account for approximately 18,000 sq. ft. of space within the ballpark.

Service Facilities

The ballpark would include baseball facilities with associated circulation concourses, exit and entry stairs, ramps and elevators, as well as concession stands, vendors' commissaries, restrooms and other facilities. The street level of the park (at the bottom of the lowest seating tier and main concourse) would be developed as back-of-house service zones such as concessionaire commissaries, vendor and usher locker rooms, maintenance facilities, groundskeeper facilities, team clubhouses, internal parking spaces, Giants' box office and public entrances.

Parking

Three levels of parking with approximately 180 spaces would be developed under the left-field and centerfield bleachers. Access to these spaces would be from King Street at the northeast end of the site. As shown in Figure II.D.2, p. II.10, the shared service drive, located east of the ballpark, would provide access to the loading docks and parking spaces within the ballpark and would also serve as access to existing parking and new parking proposed by the Redevelopment Agency for South Beach Harbor. This parking would be used by players, administrative staff, selected seat holders and by users of other facilities within the ballpark, such as the centerfield restaurant, described below.

Loading Docks

A loading dock area would be located off King Street near Second Street underneath the left-field bleacher seating. It would contain seven loading docks to be used for concession delivery, broadcast trucks, merchandise delivery and waste removal. Access to the loading area would be from King Street, via the shared service drive, to be located immediately east of the ballpark.

RESTAURANT USES

The proposed centerfield restaurant structure would be located just beyond the centerfield bleachers. It would adjoin the proposed waterfront walkway at its eastern end. Portions of the restaurant facilities would overlook China Basin Channel, South Beach Marina, and San Francisco Bay. The four-level structure of the ballpark and restaurant would be designed with setbacks to reduce the height and bulk along the waterfront.

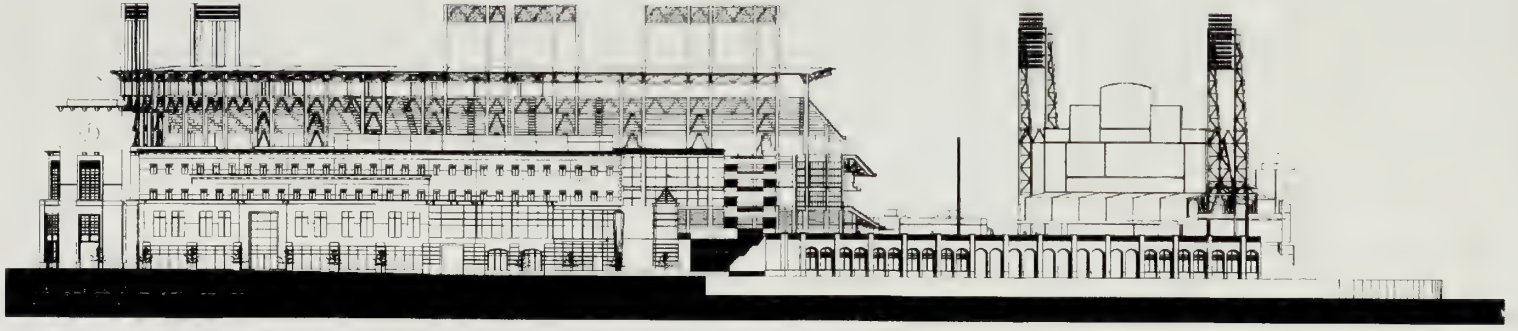
Restaurant facilities on three of the structure's four levels totaling approximately 35,000 sq. ft. would be open to the public all year. The first and second levels (approximately 25,000 sq. ft.) would contain a restaurant and bar. The fourth level (approximately 10,000 sq. ft.) is envisioned as a high-quality restaurant that would have views of the water and the playing field.

A third-level food court would be accessible only from within the ballpark during ballgames and other events via the outfield concourse of the ballpark. This level would not be open to the public year-round.

RETAIL/COMMERCIAL (PAVILION BUILDING)

The Third Street side of the ballpark would include a four-level building containing approximately 136,000 sq. ft. (see Figures II.D.3 and II.D.4). This space, referred to as the Pavilion Building, would have two entrances and two public plazas. One entrance would be at King and Third Streets, and one entrance would be located adjacent to the Port Walk and Lefty O'Doul Bridge. Access to the ballpark would be provided at each plaza. A service drive would be located at grade, underneath the Pavilion Building and would provide access to a small surface parking (approximately 25 to 30 spaces) and delivery area. Adjacent to the waterfront plaza, to the south of the Pavilion Building, there would be small retail spaces for uses related to the ballpark.

East/Marina Elevation



West/Third Street Elevation

0 Feet 100

SOURCE: Hellmuth, Obata, & Kassabaum

GIANTS BALLPARK

● **Figure II.D.3** East/Marina Elevation
Figure II.D.4 West/Third Street Elevation

Occupancy of the Pavilion Building itself is contemplated as follows: ground-level retail; second-level Pacific Bell Children's Learning Center and Communications Center (Pacific Bell Center); third-level broadcast studios and facilities; and fourth-level Giants' executive offices.

The first level of the Pavilion Building would contain approximately 43,000 sq. ft. of retail space that would be open to the public year-round.

The second level, approximately 31,000 sq. ft., would contain the Pacific Bell Learning Center and the Pacific Bell Communications Center. The Learning Center is intended to provide children the experience of accessing information and knowledge through the use of state-of-the-art computer technology. Pacific Bell expects to serve as many as 50,000 visitors annually. The Communications Center is designed to serve as a briefing and demonstration space displaying Pacific Bell's telecommunication products. Both facilities would be open from about 10:00 a.m. to 5:00 p.m. The closing time would be extended to 10:00 p.m. during night games.

The third level, approximately 31,000 sq. ft., would be used for commercial broadcast offices, sales, support and after-game show production, such as interviews with the players.

The Giants' executive offices, approximately 31,000 sq. ft., would be on the fourth level and would contain team and ballpark operations and administration.

PARKING PLAN

On-Site Parking

Approximately 210 parking spaces would be provided within the ballpark for the team, Giants' administrative staff, and employees of the year-round restaurant, broadcast studio,

the Pacific Bell Center and the other uses in the Pavilion Building. These include 180 spaces under the centerfield bleachers for the ballpark and 25 to 30 spaces for the Pavilion Building (see Figure II.D.2, p. II.10).

Parking South of the Channel

The project sponsor intends to provide dedicated surface parking for games and other events at the ballpark. The parking plan calls for at least 5,000 parking spaces immediately south of the China Basin Channel on properties owned by the Catellus Development Corporation and the Port of San Francisco. The parking facilities would be operated on an interim basis at approximate locations identified in Figure II.D.5. The project sponsor is in the process of negotiating the terms under which the parking spaces would be made available.

The project sponsor is working with the Port of San Francisco and Catellus Development Corporation to develop the design of the parking area. A variety of surface treatments are being considered for the parking area. These surface treatments may be used for some or all areas to be developed for parking. They include: surface grading, paving with a 2- to 9-inch asphalt cap or another appropriate surfacing material, striping, and the construction of drainage and gutter improvements where necessary. Some sidewalks and curbing may be installed in high-volume pedestrian areas.

To insure safety and security of parking areas, the design may include: landscaping, lighting, fencing, entrance gates and appropriate signage at street level to direct ballpark parking traffic. Fencing may be of the chain-and-post variety, but some "cyclone" fencing might be used in tightly controlled areas. Landscaping might replace fencing in some areas. Entrance gates would likely be "arm"-style barriers.

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure II.D.5 Proposed South of Channel Parking Areas

For safety reasons, some pole-mounted lighting might be used in coordination with pavement lighting. The lighting for the parking areas has not been designed.

Permanent parking is expected to be developed in conjunction with the replanning of the area south of China Basin Channel. For purposes of analysis, it is assumed in this EIR that structured parking to serve the ballpark would be available by the year 2015. Ballpark parking would also be available at existing parking facilities north of China Basin.

This Environmental Impact Report also analyzes two parking program variants: a "No Dedicated Parking Variant" where the project would not include any dedicated parking south of China Basin Channel; and an "Increased Dedicated Parking Variant" where the project would include the 5,000 spaces of interim dedicated parking proposed as part of the project and 1,800 additional parking spaces on Port land south of the Channel.

USES OF THE BALLPARK

The primary use of the ballpark would be for approximately 80 Giants' home baseball games per year. Up to 13 weekday afternoon games, customarily beginning at 12:35 p.m., would be scheduled by Major League Baseball each season. The remainder would be weekday and weekend night games beginning at 7:35 p.m. and weekend day games beginning at 1:05 p.m. The ballpark would also be used for post-season games (play-offs and the World Series) and exhibition games (e.g., All-Star Game).

The ballpark may be used for events other than baseball. Up to five times a year, events may be held at the ballpark utilizing all of the ballpark's existing seats and temporary seats on the field. These events could occur at varying times. The ballpark's capacity for such events could exceed 50,000 seats. Such events might range from music and entertainment presentations to a large civic gathering for the 4th of July or the visit of a prominent figure.

- In addition to the five maximum-capacity events, the ballpark could be used for up to 20 other open-air non-baseball events with attendance ranging from 15,000 to 42,000 people. Additional smaller open-air events could be held. Of the open-air non-baseball events, no more than 12 would be concerts with amplified music, or similarly noisy events.[3]

The project sponsor is also considering creating a temporary 5,000- to 15,000-seat, enclosed amphitheater inside the ballpark. This temporary structure could be used for 30 to 40 music and other events a year. The temporary, tent-like amphitheater, encompassing the infield and lower grandstand areas of the ballpark, would be covered by a tensile fabric roof. The roof would be anchored in the outfield behind second base and would connect to the upper deck of the ballpark behind home plate. The amphitheater structure would not extend beyond the upper rim of the stadium and would not be visible from the street outside the ballpark. Inside the amphitheater, a temporary stage would occupy the area around second base and temporary field seating would cover the infield. Existing lower box seats, club seats and luxury suites located in the "infield" portion of the ballpark would be within the amphitheater structure. Concession and restroom facilities on the main concourse of the ballpark would serve the temporary music amphitheater.

- Non-baseball weekday afternoon events would be scheduled to end before 4:00 p.m. Non-baseball weekday evening events would be scheduled to begin at 7:30 p.m. or later.

BALLPARK CONSTRUCTION

The ballpark would be designed in a traditional manner with modern amenities similar to recently constructed ballparks in Maryland (Camden Yards, home to the Baltimore Orioles) and Colorado (Coors Field, home to the Colorado Rockies). These facilities have been designed as urban baseball parks, with a design sensitive to surrounding uses, buildings and transportation systems. These newer parks are relatively small and intimate, with sight lines developed specifically for baseball, rather than for multiple uses.

The ballpark's King Street facade would feature brick with stone trim and large industrial-style windows, reflective of the older commercial buildings across King Street and elsewhere in the

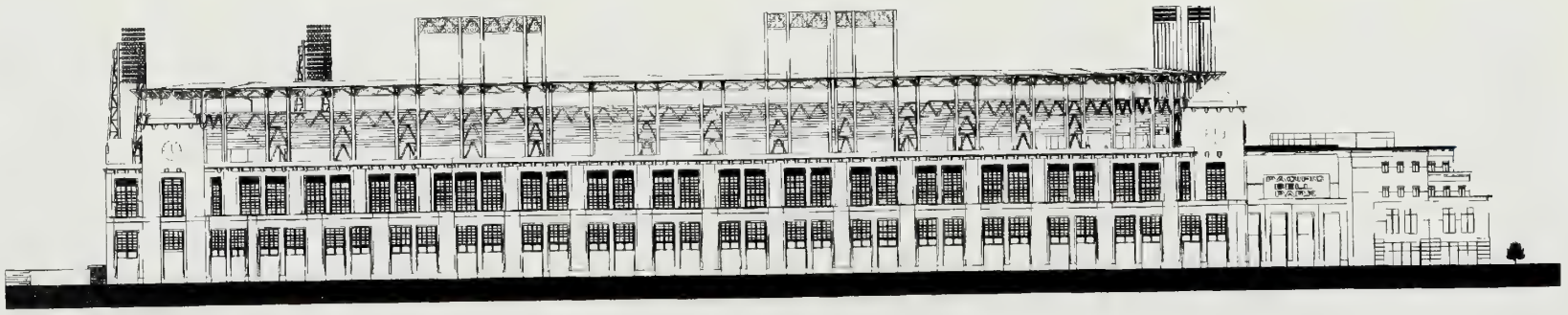
South of Market area. The design of the ballpark places seating close to the playing field, with sight lines for baseball optimized, and viewing unobstructed by structural supports.

The waterfront would serve as a key element in the project design (see Figure II.D.6). Nearly all of the ballpark's waterfront frontage would be just beyond the right-field wall (see Figures II.D.7 and II.D.8). The existing waterfront area at Pier 46B, now off-limits to pedestrians, would be improved to provide access to the ballpark and waterfront. Pedestrians on the walkway along the waterfront could see into the ballpark through a series of arched openings that would provide a direct view of the playing field. Proposed improvements to the existing walkway surface include the application of a new patterned concrete surfacing with a salt or exposed aggregate finish.

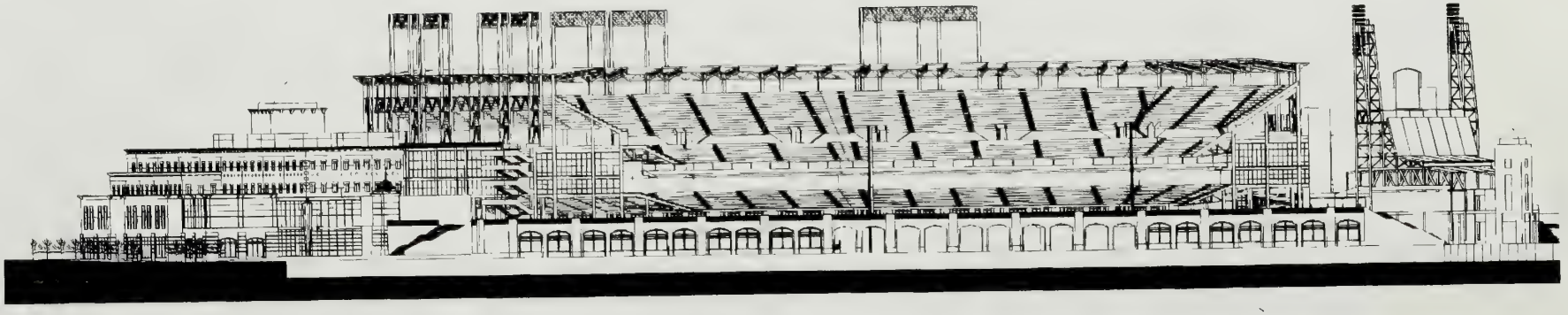
A railing would be extended along the waterfront's edge for the full length of the ballpark site. The walkway would be appropriately lighted. Street furniture would be located along the waterfront walkway as appropriate. The project sponsor is working with the Port of San Francisco and other governmental agencies to secure financing necessary for the provision of berthing facilities for ferry service at China Basin.

SITE DEMOLITION AND PREPARATION

The project would require demolition of eight buildings north of Berry Street. Together these one- and two-story structures contain about 111,000 sq. ft. Portions of the buildings north of the Berry Street frontage on the same block facing King Street were demolished for construction of the King Street/Embarcadero improvements. The three Port buildings south of Berry Street would also be demolished. These one- and two-story structures total about 316,000 sq. ft. of floor area. Overall, 11 buildings containing about 427,000 sq. ft. would be demolished. Addresses of buildings to be demolished are provided in IV.B. Land Use, Table IV.B.1, p. IV.18.



North/King Street Elevation

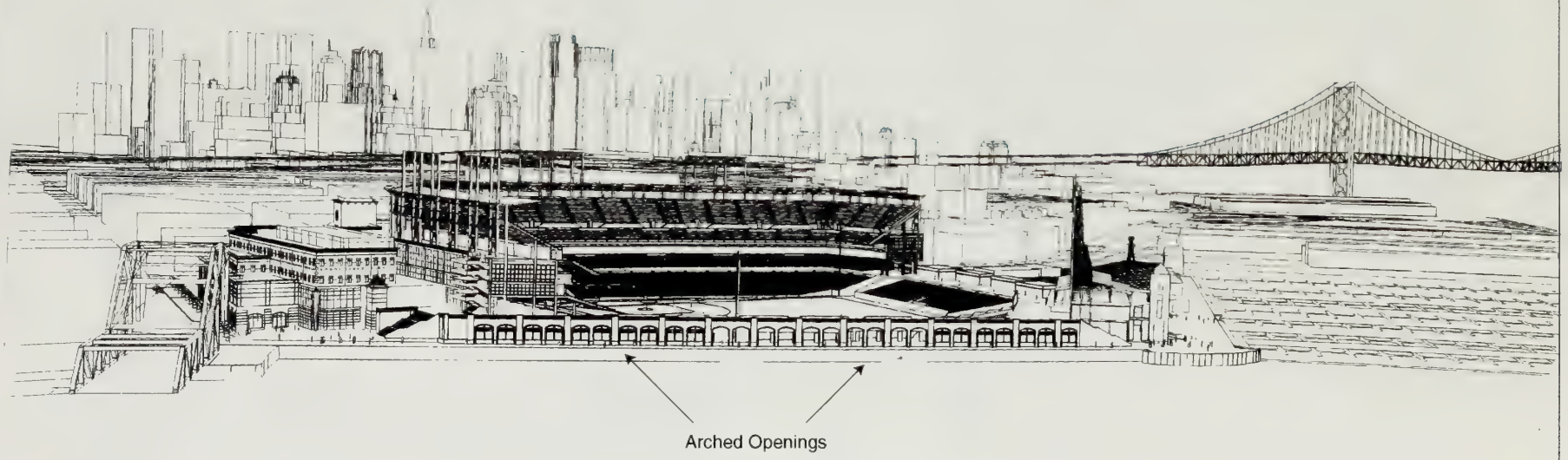


South/Port Walk Elevation

0 Feet 100

SOURCE: Hellmuth, Obata, & Kassabaum

Figure II.D.6 North/King Street Elevation
Figure II.D.7 South/Port Walk Elevation



SOURCE: Hellmuth, Obata, & Kassabaum

GIANTS BALLPARK

● **Figure II.D.8 Waterfront Port Walk**

Although most construction materials for the ballpark would arrive at the construction site by truck, barges could be used to bring in massive materials such as precast concrete piles to be used in the substructure of the ballpark. Barges also could be used for construction-office space, short-term storage and staging of materials, and for performing repairs on the bulkhead.

The repair of the existing bulkhead wall and pier structure for use as a walkway requires the installation of a corrosion prevention system and construction of a structural connection to the ballpark's new pile-supported mat foundation along the full length of the pier. Repairs would also be made to the surface of the walkway, and the corroded steel components on the bulkhead and walkway deck would be replaced. Site preparation would include re-routing sewer flows (see IV.J. Water Quality and Aquatic Ecology, pp. IV.323 - IV.325).

E. PROJECT EMPLOYMENT

A total of about 1,800 people would work at the ballpark at a sold-out game (see Table II.E.1). Approximately 1,400 of the 1,800 employees would work only on game days during the season. Most of these jobs directly related to games would be filled by 3Com Park employees who would transfer to the new ballpark. Employees under the category "Other Employees" in Table II.E.1 would work year-round. Year-round employment would be provided by the waterfront restaurants and the various Pavilion Building uses.

F. PROJECT SCHEDULE, COST, AND APPROVAL REQUIREMENTS

SCHEDULE AND COST

Demolition of all existing buildings would occur during the approximately four-month period of July to October 1997. Construction of the ballpark, if approved, would commence

immediately thereafter. Construction is expected to take about 29 months. The ballpark is scheduled to be ready for opening day in April 2000. The estimated cost of developing the ballpark is approximately $265 million.

TABLE II.E.1
BALLPARK EMPLOYEES

EMPLOYEES DIRECTLY RELATED TO GAMES	NUMBER OF STAFF
Giants Day-of-Game Employees (including groundskeepers, engineers, plumbers, medical support, switchboard operators, ticket takers, ticket sellers, ushers, parking cashiers and attendants, security, maintenance, and law enforcement personnel)	500
Concessionaire Employees	715
Players, Coaches, and Trainers	80
Media Personnel	135
Subtotal of Employees Directly Related to Games	1,430
OTHER EMPLOYEES	
Commercial Facilities (including waterfront restaurants)	100
Pavilion Building	
Ground-floor Retail	30
Second-floor Learning Center	25
Third-floor Broadcast Facilities	100
Fourth-floor Giants' Administration Facilities	120
Subtotal of Other Employees	375
TOTAL NUMBER OF EMPLOYEES	**1,805**

Source: Letter from Jack F. Bair, Vice President and General Counsel, San Francisco Giants, to William F. Hurrell, Regional Vice President, Wilbur Smith Associates, October 16, 1996.

APPROVALS

General Plan Amendments

The project would require amendments to the *San Francisco General Plan* (General Plan). The City has proposed General Plan amendments pursuant to Proposition B to ensure that the project is consistent with the overall General Plan policies and objectives. These amendments include modifications to the Urban Design, Recreation and Open Space, and Northeastern Waterfront Area Plan elements as described in the "Proposed Ballpark Master Plan Amendments" published by the Planning Department on June 20, 1996, and described further in III.A. and IV.A. Consistency with Existing Plans and Policies.

Environmental Review

Following a public hearing on this Draft EIR, responses to written and oral comments will be prepared. The EIR will be revised accordingly and presented to a joint hearing of the Planning Commission and the Redevelopment Agency Commission for certification as to its accuracy, objectivity and completeness.

Priority Planning Policies

On November 4, 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative. The measure established eight Priority Policies (Planning Code Section 101.1). These policies are: preservation and enhancement of neighborhood-serving retail uses; conservation and protection of neighborhood character; preservation and enhancement of affordable housing supply; discouragement of commuter automobiles; protection of industrial and service land uses from commercial office development and enhancement of

resident employment and business ownership; earthquake preparedness; landmark and historic building preservation; and protection of sunlight access to public open space and public vistas.

Prior to issuing a permit for any project that requires demolition, conversion or change in use, a finding of consistency with the City's General Plan, or an Initial Study under CEQA, or adopting any zoning ordinance or development agreement, the City is required to find that the proposed project or legislation is consistent with the Priority Policies. The Planning Commission or Department of Planning, during the review and approval process for the project, would make a determination of the project's conformance with the Priority Policies, and would so advise any other approving bodies, including the Board of Supervisors.

Redevelopment Plan Amendment

The proposed project includes an amendment to the *Rincon Point-South Beach Redevelopment Plan*, including the Design for Development document. The proposed amendment consists of adding the project area to the plan area, designating its land use and providing certain development standards (see II.D. Project Characteristics, p. II.7). The Redevelopment Plan amendment would require approval by the Redevelopment Agency Commission and Board of Supervisors.

The following specific actions would need to be taken by the Redevelopment Agency Commission: joint certification of the EIR with City Planning Commission; CEQA findings; adoption of Redevelopment Plan amendment; and authorization of Owner Participation Agreement.

Planning Commission

The following specific actions would need to be taken by the Planning Commission: certification of EIR and adoption of mitigation monitoring program; CEQA findings; determination of and recommendation regarding General Plan consistency of Redevelopment Plan amendment and street vacations; General Plan amendments; and Conditional Use Authorization.

Zoning Administrator

The Zoning Administrator would need to grant approval of the proposed dedicated parking as an interim use in the Mission Bay area south of China Basin Channel.

Port Commission

The following specific actions need to be taken by the Port Commission: adoption of mitigation monitoring program; CEQA findings; acquisition of Caltrans parcel; authorization of street vacations, ground lease and Public Trust/Burton Act findings; possible *Waterfront Land Use Plan* amendment and findings of consistency with *Waterfront Land Use Plan* (if adopted); and issuance of demolition and building permits.

Board of Supervisors/Department of Public Works

The following specific actions would need to be taken by the Board of Supervisors: CEQA findings and adoption of mitigation measures; approval of Port's acquisition of Caltrans parcel; consistency findings and authorization of street vacations; ground lease;

Redevelopment Plan amendment; and General Plan amendments. The Department of Public Works would need to approve a Parcel Map for reconfiguration of lot lines.

Bay Conservation and Development Commission

The project is also subject to approval by the San Francisco Bay Conservation and Development Commission (BCDC). BCDC has "Bay" jurisdiction at this site in tidal areas up to Mean High Water and "shoreline band" jurisdiction over lands 100 feet inland of the Bay. The ballpark would be reviewed by BCDC for compliance with requirements set forth in the *San Francisco Bay Plan* and *San Francisco Waterfront Special Area Plan*. The following specific actions would need to be taken by BCDC: Major Permit approval for uses within 100-ft. shoreline band and Bay; approval for new fill associated with public access improvements.

State Lands Commission

As the project would be located on land subject to the public trust, the ballpark and its associated uses must be consistent with the public trust as required by the State Constitution and relevant court decisions. Although no permit is required in connection with the Public Trust, in approving the ground lease for the project, the Port Commission must determine that the ground lease is consistent with the Public Trust and the Burton Act. In addition, both to memorialize the consistency of the project with the Trust and to facilitate project financing, the State Lands Commission would be requested to review and approve the ground lease. The State Lands Commission would assess the project in the context of other surrounding uses of Burton Act land and assess the adequacy of the rent provided for in the lease.

Other Approvals/Actions

The following are other actions required for the project:

- California Transportation Commission: approval of sale of Caltrans parcel to the Port.
- Regional Water Quality Control Board: approval of soil remediation plan; review of Soil Management Plan.

NOTES - Project Description

1. Proposition B referred to Section 249.[14] which was later changed to 249.[18].

2. The urban model contrasts sharply with many ballparks built in the 1960s and 1970s. These stadiums, Candlestick included, were built in open or suburban settings, rely nearly exclusively on the automobile for access and, as a consequence, are surrounded by large surface parking lots. In California, Jack Murphy Stadium in San Diego, the Oakland - Alameda County Coliseum in Oakland, Anaheim Stadium in Anaheim and Dodger Stadium in Los Angeles are examples.

3. Jack F. Bair, Esq., Vice President and General Counsel, San Francisco Giants, June 2, 1997.

III. ENVIRONMENTAL SETTING

A. CONSISTENCY WITH EXISTING PLANS AND POLICIES

The project site is subject to policies and regulations of a number of public agencies. This section provides a summary of the plans and policies and regulations of the City and County of San Francisco, and regional, state, and federal agencies that have policy and regulatory control over the project site. An identification of agencies with jurisdiction over the project is presented below followed later in this section by a detailed description of the responsibilities of each agency with respect to consideration of the project for approval.

The agencies include:

City and County of San Francisco: The entire project site is within the jurisdictional boundaries of the City and County of San Francisco (City). As discussed in detail below, portions of the project site are controlled primarily by City policies and plans, while other portions are also subject to additional regulations and policies of other agencies.

Port of San Francisco: The portion of the project site south of the Berry Street right-of-way between Third Street and Second Street is within the jurisdictional boundaries of the Port of San Francisco (the Port). Once the Caltrans property north of Berry Street is acquired, the entire site would be within the Port's jurisdiction. The Port has the authority to operate, maintain, regulate and improve the Bay properties of San Francisco that were transferred in trust to the City and County of San Francisco from the State of California under the Burton Act in 1968. The Port must administer Port lands consistent with public trust restrictions embodied in the public trust doctrine of law. State Attorney General Opinions and the Courts have, over the years, shaped the public trust doctrine and applied law of public interest uses.

San Francisco Redevelopment Agency: Portions of the project site are within the jurisdiction of the San Francisco Redevelopment Agency (SFRA). These are: the Second Street right-of-way from Townsend Street to Berry Street, a portion of Seawall Lot 336, and the area abutting Pier 46B on the north and east side. The SFRA imposes land use controls through implementation of adopted redevelopment project area plans. Land use plans and policies for this area are contained in the *Rincon Point - South Beach Redevelopment Plan* and the *Design for Development* document. The balance of the site is also proposed to be incorporated in the plan area.

San Francisco Bay Conservation and Development Commission: The portion of the project site within 100 ft. of the shoreline and any activities in the Bay associated with the ballpark are within the permit jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC), created by the McAteer-Petris Act (California Public Resources Code Sections 66600 *et seq.*). The proposed ballpark would be reviewed by BCDC for compliance with requirements set forth in the McAteer-Petris Act, the regulations promulgated pursuant thereto, and BCDC plans and policies including the *San Francisco Bay Plan* and *San Francisco Waterfront Special Area Plan.*

California State Lands Commission: The portion of the project site south of the Berry Street right-of-way, including Pier 46B, is held in public trust by the City and County of San Francisco. Construction of the ballpark could be subject to review by the State Lands Commission (SLC) to determine the compatibility of the proposed use with public trust policies.

U.S. Coast Guard: The U.S. Coast Guard has permitting authority for the drawbridges on the China Basin Channel at Third Street and Fourth Street. Modifying the bridges, or construction of a new bridge, would require a coast Guard Bridge Permit.

Army Corps of Engineers: The Corps would review any portion of the project that involves structures or dredging within the channel area or on the Bay shoreline, or proposed discharges of dredged materials into the Bay.

CITY AND COUNTY OF SAN FRANCISCO

San Francisco General Plan

The *San Francisco General Plan* (General Plan), adopted by the Planning Commission, is the comprehensive, long-term plan containing the land use policies for San Francisco. The General Plan includes the following elements: *Land Use*; *Commerce and Industry*; *Residence*; *Transportation*; *Urban Design*; *Recreation and Open Space*; *Community Facilities*; *Environmental Protection*; *Energy*; *and Community Safety*. In addition to the policies set forth in General Plan Elements, the project is subject to policies established in Area Plans adopted as part of the General Plan. The two Area Plans that pertain to the project site are the *Northeastern Waterfront Area Plan* and *Central Waterfront Area Plan*.

The Port of San Francisco has proposed detailed amendments to the *Commerce and Industry Element*, *Recreation and Open Space Element, Northeastern Waterfront Plan* and *Central Waterfront Plan* portions of the San Francisco *General Plan* in order to establish consistency with and enable the implementation of the WLUP. The proposed WLUP and the conforming amendments to the General Plan have not yet been adopted. Since the WLUP conforming amendments provide an update of background or contextual information upon which certain General Plan objectives and policies are based, the nature of the proposed amendments is noted when relevant to the ballpark proposal.

Amendments to the General Plan that are proposed by the City pursuant to Proposition B are discussed in IV.A. Consistency with Existing Plans and Policies.

Commerce and Industry Element

The *Commerce and Industry Element* of the General Plan is intended to serve as a guide for both the public and private sectors in making decisions related to economic growth and change.

Three general goals and ten objectives are stated in this element. The goals are general guidelines to the City's economic planning, and the objectives focus more closely on specific sectors of the economy. The first goal is to maintain and expand a healthy and diverse economy. The second seeks to assure that all segments of the labor force benefit from economic growth. The third goal is to maintain and enhance the environment.

None of the specific objectives focus expressly on the sports industry. Several objectives relate to creating a diverse economic base, increasing tourism and increasing the jobs available to all sectors of the labor force. Objective 5 relates to maritime activities, seeking to realize San Francisco's full maritime potential.[1] The policies stated under Objective 5 most relevant to the project are as follows:

- Policy 1: Develop and implement a comprehensive long range maritime development program for the port.
- Policy 2: Focus investment on those port features in which San Francisco has a natural advantage. Create competitive advantages by providing more cost efficient freight handling facilities.
- Policy 4: Avoid actions which may serve to displace desired existing maritime uses.
- Policy 8: Encourage maritime activity which complements visitor activity and resident recreation.

Recreation and Open Space Element

The *Recreation and Open Space Element* presents objectives and policies to meet San Francisco's needs for recreation and open space at region, city-wide and neighborhood levels.[2,3]

Objective 2 states: "Develop and maintain a diversified and balanced citywide system of high quality public open space."

The policy stated under Objective 2, relevant to the project, is as follows:

- Policy 3: Preserve sunlight in public open spaces.

The element identifies a "shoreline zone" and includes land use policies, open space requirements, public access, and urban design measures for new development within the shoreline zone. The portion of the project site within the Port's jurisdiction is subject to the *Northeast Shoreline Plan* zone policies.

Objective 3 states: "Provide continuous public open space along the shoreline unless public access clearly conflicts with maritime uses or other uses requiring a waterfront location."

Policy 1 stated under Objective 3 (Shoreline), the most relevant to the project, is as follows:

- Policy 1: Assure that new development adjacent to the shoreline capitalizes on its unique waterfront location, considers shoreline land use provisions, improves visual and physical access to the water, and conforms with urban design policies.

The discussion under Policy 1 identifies priority, restricted and prohibited land uses. The element states that "...industry or commercial uses that are not dependent upon use of the water should not be permitted." (p. I.3.26)

The element also contains specific policies for open space development at specific locations. The following policy for the Northeastern Shoreline area is relevant to the proposed project.

"South Beach Small Boat Harbor and Park

"Create a new six or seven acre public park and small boat marina east of the Embarcadero Roadway. Provide broad lawn areas and landscaped grounds. Remove piers 42, 44, 46A and portions of Pier 40, creating a sheltered small boat harbor that

can accommodate 700 boats. Include a public boat launching ramp in the development if possible.

"Redevelop pier 40 to provide facilities required for the small boat harbor, and provide public access for viewing, fishing, and other activities along the pier. Include provision for a bicycle trail and pedestrian promenade linking open space along the waterfront, as well as the recreation oriented public transit line that is being considered for the waterfront. The greatest portion of the park should be a gently sloping well landscaped lawn area designed to accommodate individuals and coordinated group activity, and permit a variety of recreational opportunities (p.1.3.37)."

Urban Design Element

The *Urban Design Element* of the General Plan provides policies with regard to City Pattern, Conservation, Major New Development and Neighborhood Environment. This Element also contains design guidelines related to height, bulk, building form, view corridors and streetscape measures. These guidelines are considered when the City reviews major development projects.

Several Objectives and Policies in the Urban Design Element would apply to the proposed project and are stated below.

Objective 2 states: "Conservation of resources which provide a sense of nature, continuity with the past, and freedom from overcrowding."

Policy 9, as follows, is relevant to the proposed vacation of Berry and Second Streets:

- Policy 9: Review proposals for the giving up of street areas in terms of all the public values that streets afford.

Objective 3 states: "Moderation of major new development to complement the City pattern, the resources to be conserved, and the neighborhood environment."

Objective 3 contains fundamental design principles and specific height guidelines for major new development. The following guidelines are relevant to the proposed project.

> Guideline D: Low buildings along the waterfront contribute to the gradual tapering of height from hilltops to water that is characteristic of San Francisco and allow views of the Ocean and the Bay (p.1.5.29).
>
> Map 4, Urban Design Guidelines for Height of New Buildings designates the site as: "0-40 ft." site.

Northeastern Waterfront Area Plan

This Area Plan was adopted as part of the General Plan in December 1980, and provides planning objectives and policies for the northern half of San Francisco's waterfront.[4] Together with the *Central Waterfront Area Plan*, the *Northeastern Waterfront Area Plan* provides long-range planning guidance for the entire Bay shoreline in San Francisco. The *Northeastern Waterfront Area Plan* includes four geographic subareas: Fisherman's Wharf, the Base of Telegraph Hill, the Ferry Building, and the North China Basin. The ballpark site is in the lower portion of the North China Basin subarea, which includes Piers 26 through 46.

The overall goals of the *Northeastern Waterfront Area Plan* are to provide for those uses which positively contribute to the waterfront's environmental quality, enhance the economic vitality of the Port and the City, preserve and enhance the unique maritime character of the area, take advantage of the unique economic opportunity provided by San Francisco Bay, and provide for the maximum possible visual and physical access to and along the Bay while minimizing the adverse environmental impacts of existing and new activities.[5] The Plan presently designates a portion of the proposed ballpark site (Pier 46B) for a Port Maintenance facility and other maritime activities for as long as practical.

The objectives and policies of the *Northeastern Waterfront Area Plan* which would apply most directly to the project are summarized below.

- Objective 1: To develop and maintain activities that will contribute significantly to the City's economic vitality and provide additional activities which strengthen the predominant uses in each sub-area of the Northeastern Waterfront, while limiting the concentration to preserve the environmental quality of the area.

- Objective 2: To diversify uses in the Northeastern Waterfront to expand the period of use of each sub-area and to promote the maximum public use of the waterfront while enhancing its environmental quality.

- Objective 3, Policy 2: Continue maritime activities on Piers 35 through 9, and Piers 26 through 38 and Pier 46B for as long as practical. When and if it is determined that those piers are not needed for maritime use, improvement plans should be adopted for each area and appropriate amendments made in this Plan. (This policy is proposed for deletion in the *Draft Waterfront Land Use Plan.)*

- Objective 10, Policy 1: Preserve the physical form of the waterfront and reinforce San Francisco's distinctive hill form by maintaining low structures near the water, with an increase in vertical development near hills or the downtown core area.

- Objective 10, Policy 5: Permit non-maritime development bayward of the sea wall only if the following qualifications are met: (a) Maximum feasible public access is provided to the water's edge; (b) Important Bay views along The Embarcadero and level inland streets are preserved and improved. Minor encroachment into the view corridors from level inland streets may be permitted under the following conditions: (1) Where the encroaching element has a distinct maritime character, is separated from the shoreline by water, and adds variety to the views along the waterfront; (2) Where minor structures (such as kiosks) are desirable to provide public amenities contributing to a continuity of interest and activity along the waterfront; and (3) Where essential maritime facilities cannot reasonably be located and designed to avoid view blockage.

- Objective 10, Map 3: "Proposed Height and Bulk Districts" designates the project site "40-X."

- Objective 10, Map 5: "North China Basin Area Land Use Plan" designates the land use for Pier 46B as "Maritime."

- Walkways and Open Space, Policy 1: Close the following streets completely: Berry between Second and the Embarcadero, the Embarcadero south of King, Main south of Bryant and Fremont south of Brannan. Close the following streets to through traffic, improve them as walkways and allow only limited local and service vehicle access: Townsend between Second and the

Embarcadero, Colin P. Kelly Jr. between Townsend and Brannan, First between Brannan and the Embarcadero, Beale between Bryant and Brannan, and Second between King and Berry Streets.

- Objective 26, Policy 1 (Pier 46B): Retain the Pier 46B area for a Port Maintenance facility and other maritime uses. If no longer needed by the Port for maritime use develop as a predominantly residential, mixed use development and include parking for the adjacent marina.

- Objective 27, Policy 1: Realign the Embarcadero roadway between Broadway and Berry Street as follows: (a) Widen the sidewalks in front of Ferry Building to create a major plaza as an appropriate terminus to Market Street. When the freeway is removed reroute the roadway inland to increase the plaza size; (b) Reroute the roadway inland to Steuart Street from Howard to Harrison Streets to reduce its impact on the waterfront and to create opportunities for water-related activities; and (c) Divert roadway traffic from Berry to King Streets to create opportunities for future water-related uses and to provide a direct transit link to the Southern Pacific Depot.

Proposed *Waterfront Land Use Plan* conforming amendments provide a comprehensive update to the *Northeastern Waterfront Plan* to reflect the removal of the Embarcadero Freeway and construction of transportation and pedestrian/public access improvements planned or underway along the entire stretch of The Embarcadero surface roadway; planned or completed new public open spaces; and the transition of most of the area from industrial and maritime (predominantly cargo shipping and related) uses to urban mixed use residential and commercial neighborhoods.

Central Waterfront Area Plan

The *Central Waterfront Area Plan* is an Area Plan of the *San Francisco General Plan*, established to guide the future development of the Central Waterfront Area, which is located adjacent to the project site to the south and southwest and includes the areas proposed for development of surface parking lots in Mission Bay.[6] The *Central Waterfront Area Plan* encompasses the Mission Bay area, as well as two subareas that include the southern portion of China Basin, the northern half of Central Basin and adjacent inland areas. The major

objectives of the *Central Waterfront Area Plan* are to maintain and expand maritime and industrial activities, complemented by residential, commercial and recreational uses on surplus land. The purpose of the *Central Waterfront Area Plan* is to encourage development to meet the city's economic and employment needs without sacrificing environmental quality.

Mission Bay Specific Plan

The *Mission Bay Specific Plan* was adopted in 1991 pursuant to Government Code Section 65450 et seq. It provides land use planning policies, specific land uses and development regulations for the Mission Bay Planning Area. Special land use designations for the area were created under the Mission Bay Plan for multiple activities, including Moderate and High-Density Residential, Offices, Hotel, Neighborhood Commercial and Open Space.

The *Mission Bay Specific Plan* was to be implemented in part by the Mission Bay Development Agreement (between the Catellus Development Corporation and the City and County of San Francisco) which contains implementation regulations, programs, public works projects and financing measures necessary to carry out the *Mission Bay Specific Plan*. The Development Agreement also established the terms and conditions for development within the plan area, and addressed topics such as master facilities plan, infrastructure financing, hazardous materials remediation, housing affordability, transportation management and economic development. The Development Agreement has been terminated, but the *Mission Bay Specific Plan*, including its land use designations and urban design policies, remains in place.

The project's proposed parking areas south of the channel are within the Mission Bay Planning Area. The land use designations for this area include open space, industrial, hotel, commercial and residential. The *Mission Bay Specific Plan* also acknowledges the phased nature of the proposed development, and authorizes certain uses, including parking, as interim uses.

Northeast China Basin Special Use District (Proposition B)

In March 1996, the area bounded by King Street, Second Street, Third Street, Second Street right-of-way from King Street to Berry Street, and the China Basin Channel was designated the Northeast China Basin Special Use District by adding Section 249.[18][7] to the San Francisco City Planning Code pursuant to Proposition B, a measure which received majority support in the March 1996 election. The purpose of the Special Use District is to accommodate the development of an open-air ballpark for major league baseball with a maximum of 45,000 seats with related commercial uses. The existing provisions of the M-2 use district (Planning Code Section 201) continue to apply except as provided below with respect to allowable conditional use, parking and architectural design.

Under Section 249.[18], an open-air ballpark, assembly and entertainment uses with associated parking, including related commercial uses, including but not limited to, general office, retail, restaurants, and live entertainment, are permitted as conditional uses. Proposition B amended the height and bulk district to 150-X. The Planning Commission may authorize these conditional uses if it makes certain architectural design findings described in Section 249.[18] (b)(4). Section 249.[18](a)(3) establishes that there is no minimum off-street parking requirement for the district (superseding the minimum City Planning Code parking requirement set forth in Section 151).

Proposition B amended the Planning Code and Zoning Map to exempt the site from the 40-X height requirement, and to provide a 150-X height and bulk limit. This designation provides a height limit of 150 ft. and no bulk limitation. "Light standards for the purpose of lighting the ballpark" would be exempt from the 150-ft. height limit.

Section 7 of Proposition B also amended San Francisco Administrative Code Chapter 61 (Proposition H), (Waterfront Land Use) to allow the ballpark and related commercial uses consistent with the provisions of Section 249.[18].

The City is further required by the terms of Proposition B to "amend its Master Plan and other relevant plans and codes in a manner consistent with this ordinance" and to "request and apply for conforming amendments to all applicable state and regional plans and regulations."

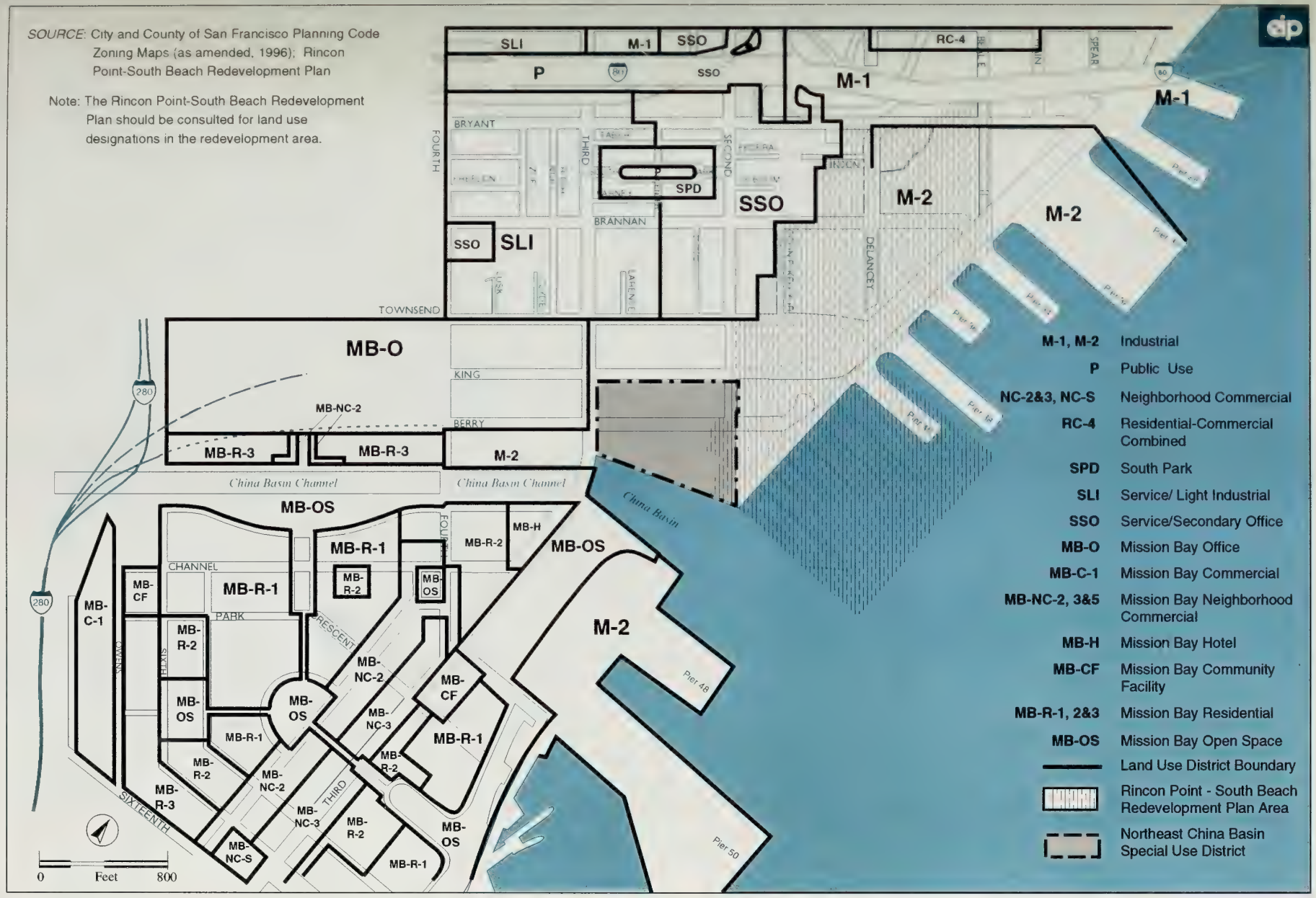
Planning Code

The City agency responsible for implementation of the Planning Code is the Planning Department. The provisions of the Planning Code, as amended by Proposition B, currently apply to development of the project site.

Land uses in the area surrounding the project sites lie with the land use districts described as follows. The area directly north of the project site is in the M-2 (Heavy Industrial) District. The undeveloped area to the west of the project site is in the MB-O, Mission Bay Office District. The site of the China Basin Building, also to the west of the project site, is in the M-1, Industrial District. The area to the east of the project site is regulated by the *Rincon Point - South Beach Redevelopment Plan* and is designated OS, Open Space.

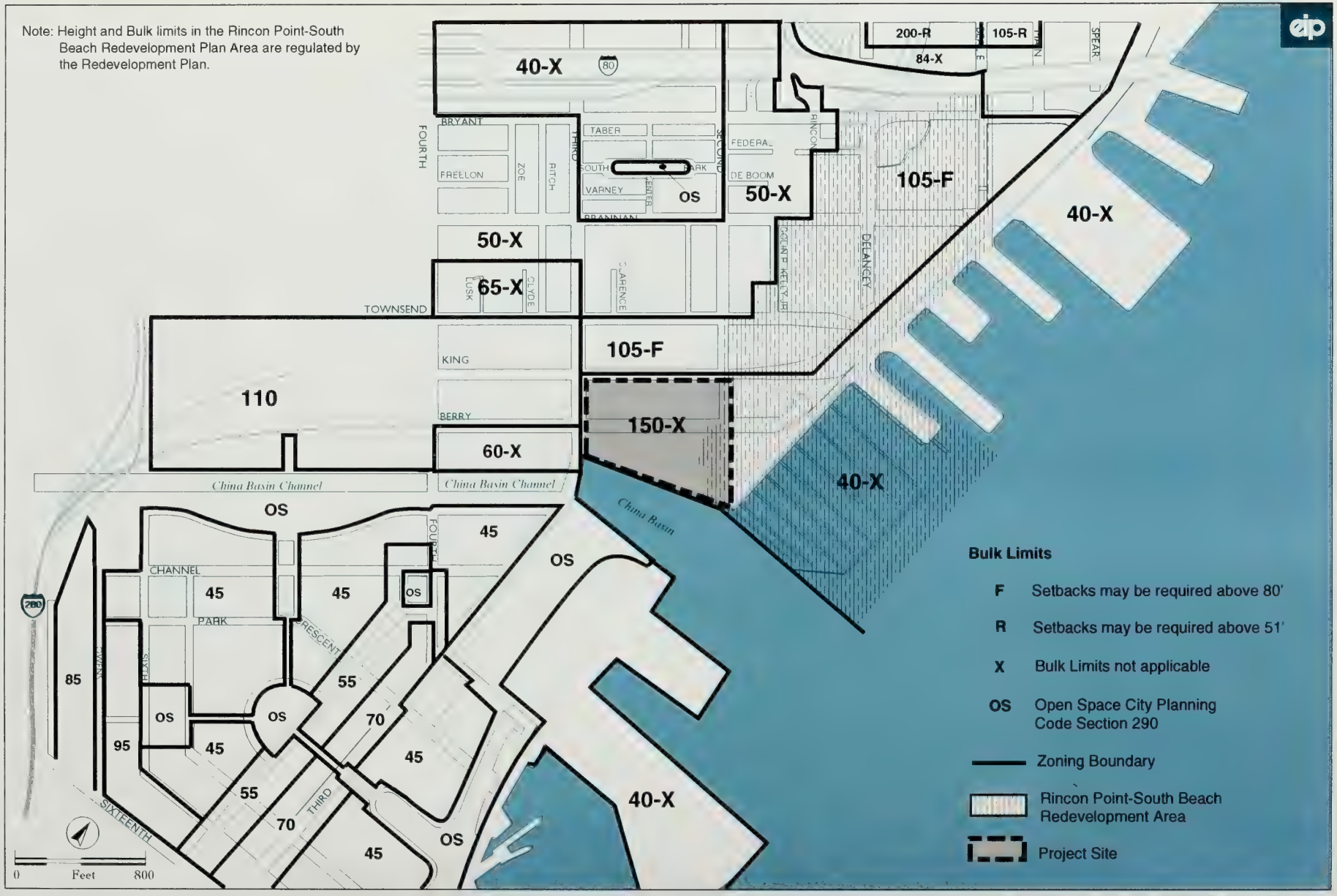
The zoning, height and bulk districts in the project area are shown in Figures III.A.1 and III.A.2, pp. III.13 - III.14. The area directly north of the project site is in a 105-F Height and Bulk District which permits development up to 105 ft. with a maximum dimension of 110 ft. in length and 140 ft. diagonal above 80 ft. The undeveloped area to the west of the project site is in a 110 ft. Height District.

The site of the China Basin Building, also to the west of the project site, is in a 60-X Height and Bulk District which allows development up to 60 ft. and no bulk limitations. The area to the east of the project site is in the 40-X Height and Bulk District. However, this area is designated as Open Space in the *Rincon Point - South Beach Redevelopment Plan*. Pursuant to the *Design for Development* guidelines for this redevelopment area, height limits on areas



GIANTS BALLPARK

Figure III.A.1 Land Use Districts



SOURCE: City and County of San Francisco Planning Code Height and Bulk Maps, EIP Associates

GIANTS BALLPARK

Figure III.A.2 Height and Bulk Districts

designated Open Space are subject to the same height limitations outlined in City Planning Code Section 290, height and bulk limits for open space districts, which provides that "the height and bulk of all buildings and structures shall be determined in accordance with the objectives, principles and policies of the Master Plan, and no building or structure or addition thereto shall be permitted unless in conformity with the Master Plan..."

PORT OF SAN FRANCISCO

The Port oversees a broad range of maritime, commercial and public activities that are integral to the local and regional economy. The Port's property includes approximately 7.5 linear miles of waterfront and adjacent seawall lots. The Burton Act of 1968 and accompanying Transfer Agreement transferred the administration and control of all Port property from the San Francisco Port Authority, a state agency, to the City and County of San Francisco, to be held in trust for the people of California and, thus, administered separately from other City property. The Port is required to promote maritime commerce, navigation and fisheries, as well as to protect natural resources and develop recreational facilities for public use.

Title to most of such property is held by the City and County, and administered through its Port Commission. Under the Act, the Port of San Francisco has power to manage, operate and administer Port lands in matters of maritime affairs, consistent with public trust restrictions established by the SLC, the City Charter, the Transfer Agreement, and local and regional plans. Thus, permits from the SLC would not be required for specific projects that are consistent with the public trust. Approval by the Port Commission is required for any uses on land under its jurisdiction. See Figure III.A.3, p. III.17, for City jurisdiction over waterfront areas.

The Port is presently considering the *Draft Waterfront Land Use Plan* (WLUP) which, if adopted, would be the comprehensive land use planning document of that agency. The *Draft*

WLUP states that a ballpark may be an acceptable land use option for the project site and requires that the project include certain elements.

The Port is also in the process of developing detailed amendments to the *Commerce and Industry Element, Northeastern Waterfront Plan* and *Central Waterfront Plan* portions of the General Plan in order to establish consistency with and enable the implementation of the *Waterfront Land Use Plan*.

The Port may enter into leases or franchises not to exceed 66 years for trust-consistent purposes as the Port Commission finds to be in the public interest.

The State Legislature reserves the right to revoke the trust grant. If that were to occur, the SLC would assume management of the Port. State Lands Commission approval may be sought for projects involving substantial capital investment because Commission approval assures the lessee that the state would honor the lease if the trust grant to the Port were revoked. The Port has frequently consulted with the SLC and the Attorney General regarding proposed development of Port lands, and various opinions issued by those agencies provide guidance regarding proposed uses.

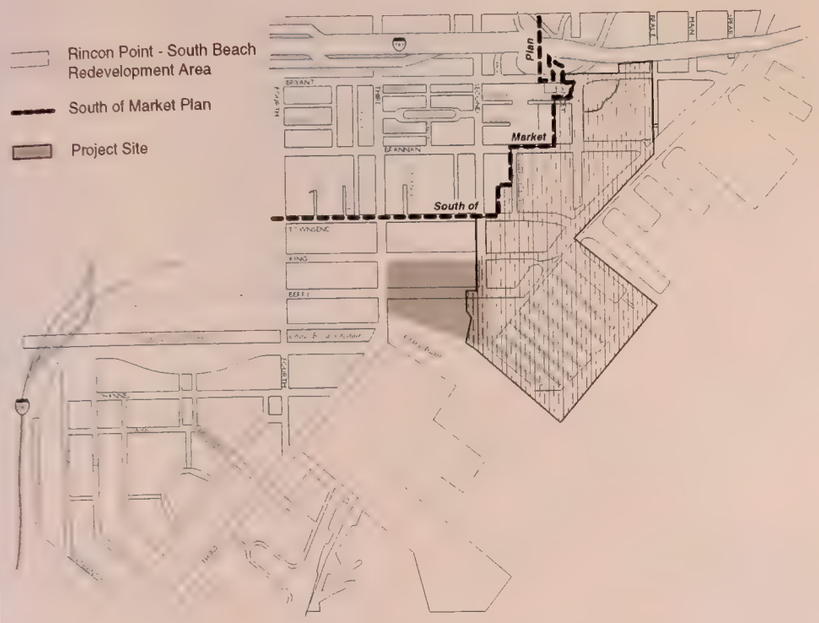
Waterfront Land Use Plan

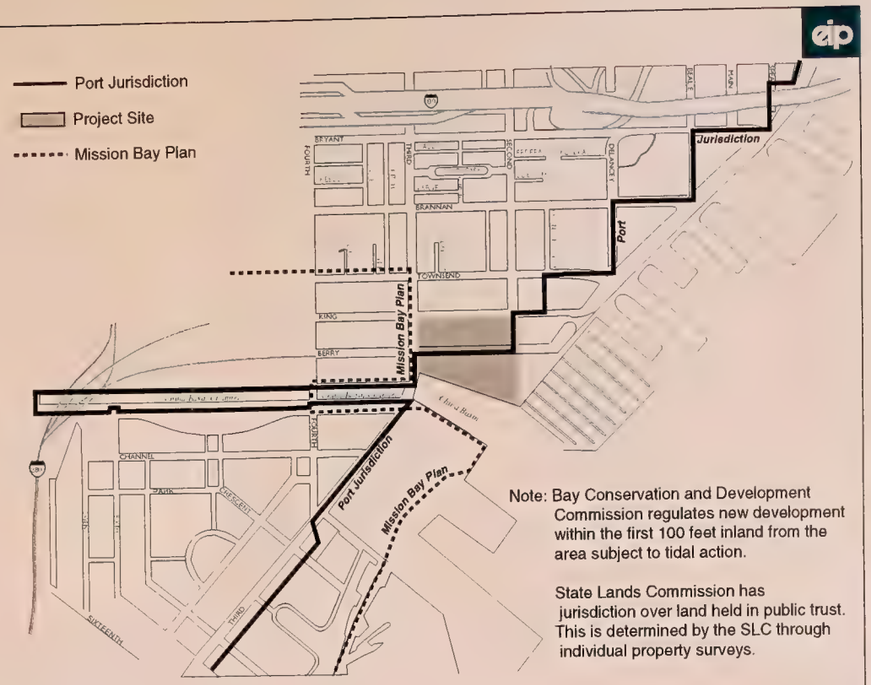
Proposed plans, policies and objectives for property under Port jurisdiction are set forth in the Draft WLUP. The Draft WLUP, if adopted, would provide the recommended land use policy for all property under the jurisdiction of the Port of San Francisco, including part of the project site.

The Draft WLUP defines the project site as a part of the China Basin Mixed Use Opportunity Area and identifies a stadium or sports facility as an acceptable use, if the Port determines that such a use is in the best interest of the Port; is approved by San Francisco

GIANTS BALLPARK

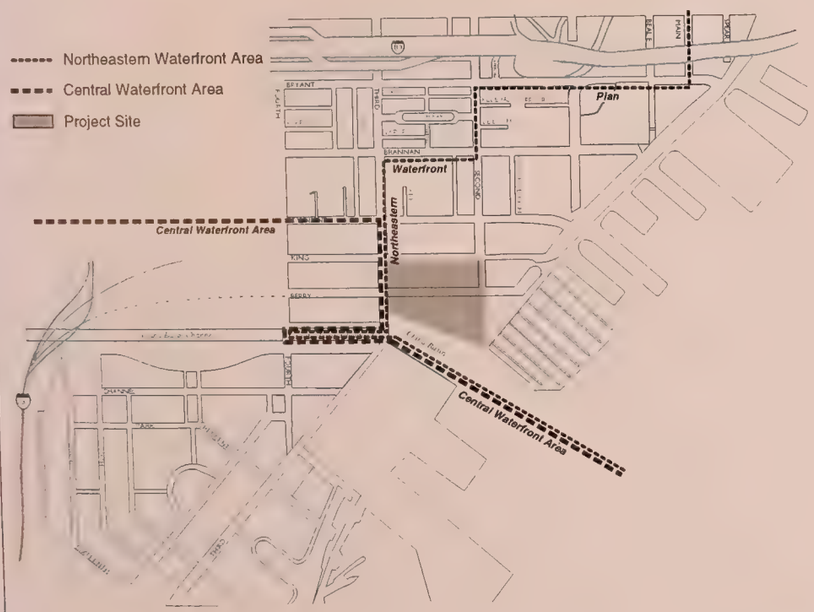
Figure III.A.3 Waterfront Jurisdiction





Note: Bay Conservation and Development Commission regulates new development within the first 100 feet inland from the area subject to tidal action.

State Lands Commission has jurisdiction over land held in public trust. This is determined by the SLC through individual property surveys.



0 Feet 800

SOURCE: City and County of San Francisco Municipal Code

GIANTS BALLPARK

Figure III.A.3 Waterfront Jurisdiction

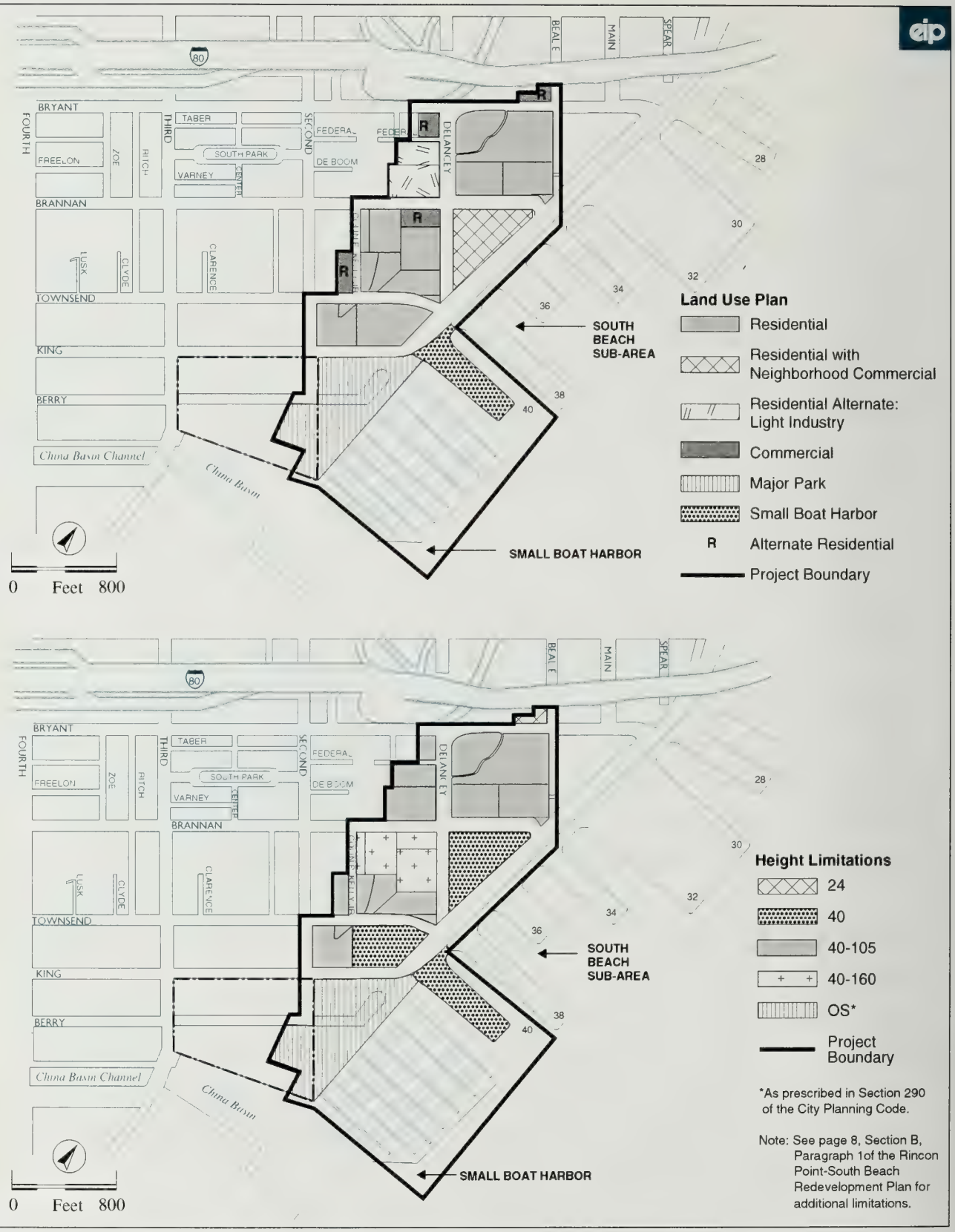
voters; and the SLC and BCDC determine that the use is consistent with their respective plans and policies. The Draft WLUP provides that if a ballpark is proposed, the height limit would need to be amended. The Draft WLUP also provides that, if a ballpark is proposed, the following would also need to be included in the project: 1) site design, public access improvements and architectural treatments which are oriented to the Bay; 2) a transportation plan with incentives to maximize use of public and group transit; 3) a parking program which maximizes shared use arrangements with parking operators in the vicinity, and locates any new parking areas away from the water; and 4) a compensation package acceptable to the Port Commission that ensures fair market return to the Port for this use of its property. The land use designations and height and bulk districts of the South Beach Subarea are presented in Figure III.A.4.

SAN FRANCISCO REDEVELOPMENT AGENCY

The Redevelopment Agency of the City and County of San Francisco established the *Rincon Point - South Beach Redevelopment Plan* in 1981 as a means of providing economic revitalization and physical renewal in an area of the City that had become underutilized and blighted as a result of declining demand for maritime-related uses.[8] The Redevelopment Agency divided the Redevelopment Area into the Rincon Point and the South Beach subareas.

The Rincon Point subarea extends from Mission Street to Harrison Street, while the South Beach subarea extends from Bryant Street to the entrance of the China Basin Channel. As part of the project, the Redevelopment Plan would be amended to include the ballpark site. The Board of Supervisors has designated the ballpark site as a redevelopment survey area on May 13, 1996, and the Planning Commission has approved the Preliminary Plan on June 27, 1996. The Redevelopment Agency Commission has accepted the Preliminary Plan and directed the preparation of a Redevelopment Plan amendment.

The portions of the project site currently within the boundaries of the Redevelopment Area include the Second Street right-of-way from Townsend Street to Berry Street, a portion of



SOURCE: San Francisco Redevelopment Agency

GIANTS BALLPARK

● Figure III.A.4 Rincon Point - South Beach Redevelopment Plan Area
Land Use Designations and Height Limitations

Seawall Lot 336, and the area of the site abutting Pier 46B on the north and east side. The land use designation for these areas would allow new development of a major park or walkways, available for recreational use and open space. The Redevelopment Plan provides for the removal or relocation of the ramp structure to Pier 46B in order to develop five to seven acres of predominately soft-surface public recreational use. Commercial activities are not allowed under the existing land use designation, except for minor amounts of commercial recreation incidental to and supportive of the open space.

Development plans for projects within Plan boundaries are to be submitted to the Redevelopment Agency for architectural review and approval. Design review will occur as part of this process. The City and the Port, in separate agreements, have agreed to aid and cooperate with the Redevelopment Agency in carrying out the Redevelopment Plan including revising zoning within the plan area to conform to the land uses and development of the *Rincon Point - South Beach Redevelopment Plan*. The Plan expires on January 5, 2021.

The Redevelopment Plan recommends that the South Beach subarea be redeveloped with mixed-income housing, neighborhood commercial, commercial, office, major park, and light industrial uses. The Redevelopment Plan is being implemented through both the retention-rehabilitation of existing properties, and the construction of new development. The current uses proposed for the blocks immediately northeast (AB 3793) and east (AB 3801 and AB 3802) of the ballpark site are Residential and Major Park, respectively. The northeast parcel includes a density range of 40 to 110 units per acre and a height range of 40 to 105 ft.; area coverage is limited to 65 percent. The height limit for the major park parcels (AB 3801 and AB 3802) is determined in accordance with the objectives, principles and policies of the General Plan, and no building or structure or addition thereto shall be permitted unless in conformity with the General Plan (Section 290, City Planning Code).

The Board of Supervisors would expand the Redevelopment Area to include the entire project site; the amendment would change the land use designation of the portion of the project site now within the Redevelopment Area, and assign a land use designation to the portion of the

project site added to the Redevelopment Area which is consistent with the land use designation established in the Northeast China Basin Special Use District (Proposition B). The area added to the Plan project area would include the southern portion of AB 3794 and Pier 46B - AB 9900.

In addition, the *Redevelopment Plan* and its companion document, *Design for Development*, would be amended to reflect certain development standards and procedures that would apply to the ballpark (see II. Project Description, p. II.7).

BAY CONSERVATION AND DEVELOPMENT COMMISSION

- The Bay Conservation and Development Commission (BCDC) has permit authority over development of the Bay and the shoreline pursuant to the provisions of the state McAteer-Petris Act (California Government Code sections 66000 et seq.). The Act requires the BCDC to prepare a "comprehensive and enforceable plan for the conservation of the water of San Francisco Bay and the development of its shoreline." In 1969 the Commission submitted the completed *San Francisco Bay Plan* to the Governor and the Legislature. The McAteer-Petris Act was later amended to give the Bay Plan the force of law.

- BCDC regulates all filling, dredging, and changes in use in San Francisco Bay; regulates new development within 100 ft. of the shoreline subject to tidal action to ensure maximum public access to the Bay is provided; and ensures that the limited amount of shoreline suitable for regional high-priority water-oriented uses is reserved for such purposes. BCDC policies are articulated in the *San Francisco Bay Plan* and *Waterfront Special Area Plan* which outline permitted uses and conditions for such uses on piers and adjacent areas.

- Of primary concern to BCDC is the placement of new "fill" in the Bay for purposes of new development. The McAteer-Petris Act imposes strict standards for the placement of fill, restricting it to uses that are: 1) necessary for public health, safety or welfare; 2) water-

oriented uses, such as water-dependent industry, water-oriented recreation, public assembly and other similar uses; or 3) minor fill to improve shoreline appearance and public access. Fill must be the minimum necessary for the purpose and can be permitted only when no alternative upland location exists.

For purposes of the BCDC, "fill" is defined as the placement of any material in or over the water surface. As interpreted by BCDC, and on the advice of the Attorney General, fill includes not only placement of new piles or pile-supported structures, but any improvement or repair to existing piles or pile-supported structures which extends the life of the structure.

San Francisco Bay Plan and McAteer Petris Act

The *San Francisco Bay Plan*, adopted in January 1969, is the BCDC policy document that specified goals, objectives and policies for BCDC jurisdictional areas for the entire Bay

Area, including waterfront land use.[9] The *Waterfront Special Area Plan* is an amendment to the Bay Plan which focuses exclusively on the San Francisco Waterfront from Aquatic Park to India Basin. Any proposed development must be consistent with the McAteer-Petris Act, the Bay Plan and the Special Area Plan.

Together with the McAteer-Petris Act[10] and the *San Francisco Bay Plan*, the *Waterfront Special Area Plan*[11] prescribes a set of rules for non-maritime shoreline development along the San Francisco waterfront.

Commercial, residential and office uses on land within BCDC's permit jurisdiction (100-ft. shoreline band) must be configured to provide the "maximum feasible public access" to the Bay.[12] Land use and structural changes are governed by policies regarding public access. BCDC can require, as conditions of permits, shoreline public access improvements consistent with the project, including pathways, bicycle racks, parking, benches, or signs. The amount and design of public access areas are determined on a case-by-case basis. The *Bay Plan* allows filling in of the Bay under certain circumstances in connection with providing public access.

The McAteer-Petris Act imposes very strict standards for the placement of fill. Placement of fill may be allowed only for uses that are: (1) necessary for public health, safety or welfare; (2) water-oriented uses, such as water-dependent industry, water-oriented recreation, public assembly, etc.; or (3) minor fill to improve shoreline appearance and public access. Fill must be the minimum necessary for the purpose and can be permitted only when no alternative upland location exists.

San Francisco Waterfront Special Area Plan

The *San Francisco Waterfront Special Area Plan* (Special Area Plan) is a plan adopted by BCDC which sets forth in more detail acceptable land uses than the *San Francisco Bay Plan*.

In some cases specific uses are assigned to specific piers. The Special Area Plan covers the San Francisco waterfront from Aquatic Park to India Basin, and serves as a guide to those seeking BCDC permits regarding the views of BCDC with regard to the requirements of the *San Francisco Bay Plan.*

The Bay Bridge to China Basin section of the Special Area Plan recommends that the vicinity of the proposed project site be redeveloped with mixed uses, including predominantly residential uses, provided the area is no longer needed for maritime uses.

Plan policy also defines Bay-oriented commercial recreation on replacement fill as a permitted use, only if the pier is no longer needed for maritime use and only if the existing pier structures cannot be used for new uses. The Plan recommends that residential and small-scale office uses be permitted on Pier 46B.

STATE LANDS COMMISSION

California became the owner of all lands underlying navigable waterways, including tidelands, within the state when it was admitted to the Union in 1850.[13] Most of those lands are still owned by the state or the legislature's public grantees under jurisdiction of the SLC. Port lands are state sovereign lands held in trust by the Port for the people of the State of California pursuant to the Burton Act and the 1968 Transfer Agreement. The public trust doctrine of the California Constitution defines allowable uses of submerged and tidelands as commerce, navigation and fisheries, water-oriented recreation and preservation of those lands as ecological units. Tidelands which are filled remain subject to the public trust doctrine and the jurisdiction of the SLC.

The SLC has stated that if the project site includes such sovereign lands, use of those lands must be consistent with the provisions of the Burton Act, the 1968 Transfer Agreement, and

the public trust. The nature and extent of such sovereign interests within the project area, if any, have not yet been fully determined.

If a proposed use were found to be inconsistent with uses permitted by the public trust doctrine, the lands proposed for such use may be exchanged for other lands if certain limited conditions can be met, pursuant to Public Resources Code Section 6307. The Port of San Francisco, as grantee, would have a role in determining those conditions with the SLC as part of the overall process.[14]

U.S. ARMY CORPS OF ENGINEERS

The San Francisco Bay and shoreline is within the jurisdiction of the U.S. Army Corps of Engineers (Corps). The Corps has permitting authority concerning projects which are in or affect navigable water ways of the United States, and its jurisdiction has been expanded under Section 404 of the Federal Clean Water Act of 1972 and Section 10 of the Rivers and Harbors Act of 1899 to include an expanded area including rivers, coastal waters, adjacent wetlands and low-lying areas behind dikes on the coast. To the extent the project involves construction work in the water of the San Francisco Bay, review by the Corps may be required. The primary purpose of the Corps' activities in this regard is to maintain the navigability of waters, to prevent the filling of wetlands and to protect and enhance water quality and biological resources.

The Corps' permitting process includes public notice and comment from several governmental agencies. These include BCDC, SLC and the U.S. Coast Guard, mentioned above. In addition, other agencies with responsibility for reviewing and commenting on Corps permit applications include the California Regional Water Quality Control Board, California Department of Fish and Game, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

NOTES - Consistency with Existing Zoning and Plans

1. Proposed *Waterfront Land Use Plan* conforming amendments provide an updated explanation of the decline in cargo shipping activity in San Francisco and the key factors involved.

2. City and County of San Francisco Department of City Planning, *Recreation and Open Space Element*, adopted by City Planning Commission Resolution 11065, July 9, 1987 and as amended.

3. Proposed *Waterfront Land Use Plan* conforming amendments provide an updated statement of existing conditions and recent efforts to develop new waterfront open spaces.

4. City and County of San Francisco, Department of City Planning, *Northeastern Waterfront Area Plan*, adopted by City Planning Commission Resolution 7643, January 31, 1980 and as amended.

5. City and County of San Francisco, Department of City Planning, *Northeastern Waterfront Area Plan*, adopted by City Planning Commission Resolution 7643, January 31, 1980 and as amended.

6. City of County of San Francisco Department of City Planning, *Central Waterfront Area Plan*, adopted by City Planning Commission Resolution 8631, July 3, 1980.

7. Proposition B referred to Section 249.[14] which was later changed to 249.[18].

8. San Francisco Redevelopment Agency, *Rincon Point - South Beach Redevelopment Plan*, adopted by Board of Supervisors Ordinance No. 14-81, January 5, 1981 and as last amended Ordinance 430-94, December 12, 1994.

9. San Francisco Bay Conservation and Development Commission, *San Francisco Bay Plan*, adopted January 1969 and as amended.

10. McAteer-Petris Act, 1965 California Government Code Section 66605(a).

11. San Francisco Bay Conservation and Development Commission, *San Francisco Waterfront Special Area Plan*, adopted April 1975 and as amended.

12. San Francisco Bay Conservation and Development Commission, *San Francisco Waterfront Special Area Plan*, adopted April 1975 and as amended.

13. California State Lands Commission, brochure.

14. The lands so exchanged would have to be found by the State Lands Commission and Port of San Francisco to be no longer available or useful or susceptible of being used for public trust purposes; the value of the lands received in exchange would have to be equal to or greater than the value of the lands given up; and the exchange would have to be in the best interests of the state. The SLC and the Port would work together with the property owner of record to determine the feasibility of such an exchange.

B. LAND USE

LOCATION

The project site is located in the City and County of San Francisco, 1 mile south of the San Francisco Financial District. The site is accessible from: 1) U.S. Highway 101 (U.S. 101); 2) Interstate 80 (I-80), via ramps at Harrison and Fremont Streets to the north of the site; and 3) the Interstate 280 (I-280) freeway via ramps located at Sixth and Brannan Streets and Fourth and Berry Streets to the west and, by mid-1997, via ramps ending at Fifth and King Streets two blocks west of the project site.

PROJECT SITE

Ownership

The site is composed of two parcels and includes Lots 3B, 26 and 27 on Assessor's Block 3794; Pier 46B and 46C (Block 9900); the Second Street right-of-way south of King Street to the east; and Berry Street between Third and Second Streets. The California Department of Transportation (Caltrans) owns the northern block of the site; the City and County of San Francisco holds in trust the southern block (Block 9900) and the area of land that makes up the Second Street right-of-way between King and Berry Streets and the Berry Street right-of-way between Second and Third Streets.

Existing Land Uses

Northern Portion of the Site

The northerly portion of the block bounded by King Street, Second Street, Berry Street, and Third Street and approximately the westerly one-fourth of the block fronting Third Street is

asphalt-paved surface parking. Approximately 300 spaces are available on a daily and monthly basis (see Figure III.B.1). This area also includes portions of the walls of the buildings that once occupied the site but were demolished for the expansion of King Street. Vehicles also park between these walls.

The southerly portion of this block contains eight buildings with a total of about 111,000 square feet (sq. ft.). The buildings are one to two stories. All of the buildings are owned by Caltrans and are leased out to various businesses. The uses include warehouse, light manufacturing and general commercial activities.[1]

These buildings form a continuous mass along Berry Street, with no separation between them. The buildings from east to west are: 860 Second Street, a two-story refurbished warehouse with various commercial tenants; 30 Berry Street, a one-story building with an interior courtyard, often leased as artist space; 36 Berry Street, a one-story building, and 40 Berry Street, a one-story building, both of which are leased by a metal-working shop; 44 Berry Street, a two-story building and 66 Berry Street, a one-story building, both of which are warehouse and storage space, sometimes used by the State of California; 50 Berry Street, a two-story building used by a packaging company; and 70 Berry Street, a one-story building which appears to be vacant.

Southern Portion of the Site

The portion of the project site bounded by Berry Street, Third Street and the China Basin waterfront is occupied by Piers 46B and 46C, 95 Berry Street, and asphalt paving (see Figure III.B.1). The three Port buildings, one- and two-story structures, include about 316,000 sq. ft. of floor area, plus about 86,000 sq. ft. of auto ramp and roof parking (open area). The Port's Maintenance Operations Facilities (MOF) are located on the ground floor of Pier 46B, a two-story concrete structure. The maintenance shops operated by the Port include sheet metal, carpentry, plumbing, painting, electrical, piping and machining.[2]

SOURCE: EIP Associates

GIANTS BALLPARK

● Figure III.B.1 Land Use In Project Vicinity

The second floor of the building is leased to businesses and is accessed via a ramp from Berry Street.

Pier 46C (35 to 65 Berry Street), a two-story concrete building, is located to the north of Pier 46B. The Port also occupies some space in this building and leases the remainder to various businesses. Between Piers 46B and 46C are two parallel railroad tracks. The area around the tracks has been paved with asphalt and the tracks are covered with a roof that joins Pier 46B and 46C.

The space in Pier 46B and 46C leased by the Port contains various commercial, light manufacturing and maritime-related uses. The tenants currently leasing space include: Adrian Studios; Douglas Broadcasting; Experimental Workshop; Flip-Way Products; Quayle and Company; Royal Charter Marine Corporation; South Beach Engine Service; Westar Marine; Underwater World Aquarium Stores, Inc.; Cassidy; Joseph Schmidt; GP Resources; and American Airporter Shuttle, Inc.[3] Pier 46B is also used for berthing and as a servicing mooring site for tugboats and other vessels.

Directly west of Pier 46C is a small, one-story building, 95 Berry Street. A fenced, paved and unpaved area used by the Port for storage of lumber and scrap metal is located to the east of Pier 46C.

PROJECT VICINITY

A survey of existing land uses for the project study area in the vicinity of the proposed project was conducted in April, August and November 1996.[4] The study area is generally comprised of four parts: 1) East of Second Street, bounded by Second Street, Harrison Street and the San Francisco Bay waterfront; 2) North of Townsend Street, the area north of the Second Street and Townsend Street intersection, including the Second-King-Third-Townsend block up to Harrison Street and across to Fourth Street; 3) China Basin/North of Channel,

the area west of Third Street, between Townsend Street and China Basin Channel; and 4) South of Channel, the area south of the Channel, west to I-280, south to Sixteenth Street and along the waterfront back up to the Channel (see Figure III.B.1, p. III.27). The study area includes areas subject to the *South of Market, Northeastern Waterfront*, and *Central Waterfront Area Plans*, the *Mission Bay Specific Plan*, and the *Rincon Point - South Beach Redevelopment Plan*.

East of Second Street

The area east of Second Street encompasses The Embarcadero from the Bay Bridge to China Basin, all of the South Beach subarea of the Rincon Point - South Beach Redevelopment Project Area, and the Second Street commercial corridor. This area includes the South Beach neighborhood which contains a mix of residential and commercial uses as described below.

Immediately east of the project site is a landscaped parking area for South Beach Park, South Beach Harbor and the Dolph P. Rempp Sailing Ship Restaurant. Also at Second and Berry Streets is a small one-story building that contains the general offices of the Ship Clerks Association (International Longshoreman Workers Union).

South Beach Park, a public park, is an approximately 5-acre site that includes a prominent metal sculpture, concrete seating areas, and benches along the promenade.[5] The San Francisco Redevelopment Agency plans to reconfigure and extend South Beach Park and parking area, placing 210-250 parking spaces under an earthen berm, the park, to accommodate visitors to the harbor. The agency is currently in the process of designing the park and underground parking to share the Second Street entrance with the ballpark project's internal parking component. The joint entrance would allow the agency to increase the number of spaces proposed to be developed. South Beach Harbor has been in operation for about ten years and has berthing facilities for 700 boats. The harbor also maintains a Harbormaster's office, restroom and shower facilities, a pump-out station, and parking. The Dolph P. Rempp Sailing Ship Restaurant has been docked at Pier 42 for over 20 years.

Landside public access to the waterfront area is available from The Embarcadero, The Embarcadero Promenade (Herb Caen Way) and the South Beach Harbor Promenade. Waterborne public access is available for recreational boats at the South Beach Harbor. The piers and bulkhead buildings along the waterfront portion of the East of Second area are in transition from predominantly maritime-industrial uses to commercial mixed uses. Although a number of piers remain on the waterfront, most of them are presently vacant. Increasingly, the buildings and piers are used for non-maritime-related activity, such as public auctions, merchandise conventions and retail warehouse sales.

The general decline of maritime activity in San Francisco has induced a shift in the East of Second area to residential and land-oriented commercial activities west of The Embarcadero. Residential uses include new developments in the Rincon Point - South Beach Redevelopment Project Area, which includes portions of the waterfront. Several large multi-unit residential developments have been built in the last ten years. These include the Steamboat Point Apartments, the South Beach Marina Apartments, the Delancey Street Foundation group residence and the Bayside Village Apartments. Several apartment buildings include retail uses such as grocery stores, restaurants, and other service retail on their ground floors.

The Steamboat Point Apartments (Townsend Street at The Embarcadero) contain 108 units, consisting of one-, two- and three-bedroom apartments in a three-story structure. The apartments are affordable housing units, managed in cooperation with the San Francisco Redevelopment Agency. The South Beach Marina Apartments (Townsend Street at First Street) consist of 414 one- and two-bedroom units, contained in four buildings. Two South Beach Marina Apartments buildings are four stories tall, while the other two buildings are 13 and 14 stories tall. The Bayside Village Apartments (Brannan Street at First Street) is a complex of nine buildings, three to six stories tall, with a total of 862 units. The complex contains studios and one- and two-bedroom apartments. The Delancey Street Foundation (Brannan Street at Delancey Street) is a non-profit residential and re-education facility

containing 177 units in a four-story complex. No residential units at Delancey Street are rented to the general public; however, the retail space on the ground floor may be leased by non-residents. Additional residential projects approved for construction in the South Beach subarea include: One Embarcadero South (Site L) at the northeast corner of King and Second Streets (233 units); Oriental Warehouse Phase II along Brannan Street between Colin P. Kelly Jr. and Delancey Streets (356 units); Site F-1 at Brannan and Delancey Streets; and Site F-2 at Federal and Delancey Streets. Portside Phase II is an approved residential project located at the intersection of Harrison and Main Streets (158 units). Each of these is indicated on Figure III.B.1, p. III.27, with an asterisk.

Along the Second Street corridor, established industrial uses have been converted to office, retail and residential activities. Factory and warehouse buildings are now used for office buildings, furniture showrooms, factory outlets, retail establishments, live/work spaces and media studios. Some residential use exists in converted commercial buildings, or in older residential buildings in scattered locations. There are also many residential units located in the same buildings as active commercial operations, typically on the floors above, and often not evident from outside observation.

The elevated structure of the I-80 freeway, the approach to the Bay Bridge, is located between Bryant Street and Harrison Street. Portions of the space below the freeway structure are operated as parking lots, or are undeveloped (see Figure III.B.1, p. III.27). Caltrans vehicles and equipment storage is also located under the freeway, near Bryant and Beale Streets. Uses under the Bay Bridge approach consist largely of parking, retail, commercial, industrial and office. Buildings in this area are former warehouse or factory structures that have been converted to office, retail or other commercial uses. Some isolated residential land uses exist. For example, a large residential/commercial mixed-use project has been constructed on the northwest corner of Bryant Street/Delancey Street. Photographic processing labs and automotive repair shops are located in this part of the study area.

North of Townsend Street

Land uses north of Townsend Street and west of Second Street in the South of Market area are generally a mix of small-scale commercial, industrial, and office, with pockets of

residential uses containing ground-floor commercial. Building heights in this area generally range between one to eight stories. The Second and Third Street corridors generally contain four- to eight-story structures, while east-west streets mainly include one- to four-story buildings.

Across King Street from the project site are one- and three-story mixed-use commercial and light-industrial buildings. The Townsend Building, located mid-block between Second and Third Streets, is five stories tall. These buildings include garment manufacturers, warehouse operations, a printing company and an electrical supply service. The buildings have red brick facades and are part of the South End Historic District.

South Park is an older neighborhood with historical importance located about two blocks north of the project site, between Third and Second Streets, and Bryant and Brannan Streets (Figure III.B.1, p. III.27). The area is characterized by small-scale residential buildings with retail, restaurant, residential and mixed uses. The buildings range from one to four stories built in a ring around South Park, a small, grassy area with play equipment and picnic tables.

The remainder of the North of Townsend Street area is generally considered the South of Market area and contains office, outlet retail, restaurant/club, residential, and commercial uses in converted industrial warehouses. Business operations encompass media production, manufacturing, auto repair, business services, eating and drinking establishments, warehouse facilities, retail establishments, printing companies, art galleries, entertainment establishments and wholesale suppliers.

China Basin/North of Channel

The China Basin/North of Channel area includes the project study area west of Third Street, south of Townsend Street, down Sixth Street and back along the China Basin Channel, excluding the Third-Berry-Fourth-China Basin Channel block.

Immediately west of the project site on the block bounded by Third, Berry, Fourth Streets and China Basin Channel are the China Basin Landing and China Basin Buildings. The structures have three and six floors, respectively, occupied with office space and some retail uses. There is a landscaped promenade south of the buildings, adjacent to China Basin Channel. The block immediately north of the China Basin Landing and China Basin Buildings is a paved parking lot.

To the northwest of the project site on the block bounded by Third, Townsend, Fourth and King Streets is the San Francisco Recreational Vehicle Park. The park has about 200 spaces for trailers and motor homes for rental on a daily or monthly basis. The park is fenced and has electrical, water and sewage hook-ups; bathrooms and showers; laundry facilities; and a general store. To the west of Fourth Street between King Street and China Basin Channel are vacant parcels and the site of the demolished I-280 freeway off-ramp.

Catellus Development Corporation is pursuing a development in the Mission Bay area north of China Basin Channel roughly bounded by Third, Townsend, and Seventh Streets and China Basin Channel, excluding the China Basin Landing and China Basin Buildings and CalTrain facilities. The proposed development would replace the recreational vehicle park and paved parking lot with entertainment/commercial and residential uses, and the vacant blocks with multi-family residential complexes, totaling up to 3,000 dwelling units and 600,000 sq. ft. of entertainment/commercial space.

The area bounded by Fourth, Townsend, Sixth and King Streets contains the CalTrain Depot and other facilities related to the commuter-rail operations, which provide train service to the Peninsula and South Bay areas. The station also contains customer services such as a newsstand and snack bar. The railroad extends west between Townsend and King Streets and turns south along Seventh Street toward the Peninsula.

The elevated structure and ramps of the I-280 freeway are situated approximately three blocks west of the project site, generally south of Berry Street. The structure and ramps connect with

the main I-280 freeway near Sixth Street. Caltrans is constructing a new I-280 freeway off-ramp that will approach and continue through a portion of the vacant parcel south of the Sixth Street and Berry Street intersection, becoming a surface street at King Street east of Sixth Street.

Vehicular and pedestrian crossing of China Basin Channel is via the Lefty O'Doul Bridge at Third Street and the Peter Maloney Bridge at Fourth Street.

South of Channel

The South of Channel area includes the waterfront area from China Basin Channel south to Pier 50, continuing west along Sixteenth Street, then north following the I-280 alignment to China Basin Channel (see Figure III.B.1, p. III.27). This area is generally known as the Mission Bay South of Channel area.

Facing the project site across China Basin is the H&H Ship Service Company recycling and tank cleaning facility, now closed, which handled identified hazardous materials. Since the late 19th century, the South of Channel area has supported warehousing, maritime-related commercial/industrial and rail uses. The South of Channel area is a former rail yard and warehousing district. Large expanses of the area are presently vacant; railroad tracks remain in some areas. The active uses in this area generally consist of warehouse facilities and truck terminals. Nearest the project site, Piers 48 and 50 regularly moor commercial vessels, while the piers farther south handle small-boat services, storage, and loading ramps. Warehouse facilities are clustered along Third Street and Illinois Street and along Sixth Street and Owens Street. The warehouses are typically one to two stories in height.

Houseboats and pleasure craft are moored along the south side of China Basin Channel, west of the Peter Maloney Bridge. Commercial facilities in the South of Channel area include warehouses; the Bladium, an in-line skating facility at Third Street and the Channel; the Mission Bay Golf Driving Range at Owens and Channel Street; and various maritime-related yacht and boating clubs along the waterfront.

- The South of Channel maritime-related waterfront uses along Terry A. Francois Boulevard include the following enterprises: Mariposa-Hunters Point Yacht Club, Bay View Boat Club, and the Port's Public Launch Ramp at Pier 52. Other uses include a paper recycling facility, small offices and warehouses, tour bus parking, and small industrial uses. Nearby industrial facilities include RMC Lonestar at 420 Mariposa Street and Kaiser Sand & Gravel at 300 Sixteenth Street, both sand and gravel plants. Both sides of Fourth Street, much of the south side of Channel Street, and the land side of Terry A. Francois Boulevard contain primarily vacant land.

SURROUNDING AREAS

Downtown San Francisco

The Downtown area is located about 1 mile to the north and northwest of the study area. Downtown San Francisco is a regional business center with a major retail center around and near Union Square, and hotel and convention facilities in the areas north and south of Market Street near Third and Fourth Streets. The project site is readily accessible to and from Downtown, mainly by way of Third and Fourth Streets or The Embarcadero.

Potrero Hill

Approximately 1 mile from the project site, south and west of the South of Channel area is the Potrero Hill neighborhood. Potrero Hill is predominantly residential with neighborhood-serving uses along Eighteenth and Twentieth Streets. Potrero Hill also has substantial commercial and industrial development in the area north of Sixteenth Street and west of Seventh Street.

Showplace Square

Showplace Square, an area with a concentration of commercial uses associated with wholesale trade, is located about three-quarters of a mile west of the project site, near Eighth

and Townsend Streets. Showplace Square generally consists of former industrial buildings that have been converted to exhibition and marketing of interior design, as well as various other products of the design trade.

NOTES - Land Use

1. 1990 Sanborn Fire Insurance Maps.

2. Gary Olson, Superintendent of Maintenance, Port of San Francisco, telephone conversation, May 1,1996.

3. Gerry Roybal, Marketing Representative, Press Relations & Community Affairs, Port of San Francisco, memorandum to EIP Associates, February 11, 1997.

4. The Land Use Survey was conducted by EIP Associates in April, August, and November 1996.

5. Walter Yanagita, Project Architect for South Beach Park, San Francisco Redevelopment Agency, telephone conversation, December 10, 1996.

C. VISUAL QUALITY AND LIGHTING

VISUAL CHARACTER

Bay Area

The 13-acre ballpark project site is located in the southeast portion of the City and County of San Francisco, at the north end of the San Francisco Peninsula. The Peninsula faces the Pacific Ocean to the west and defines the western edge of San Francisco Bay to the east. The cities of Oakland and Alameda are located about four miles east of and opposite San Francisco, and, along with other municipalities, form the east edge of San Francisco Bay. The San Francisco-Oakland Bay Bridge is a prominent man-made feature in this regional setting, connecting the west and east sides of the Bay. The San Francisco anchorage of the Bay Bridge is located about one-half mile north of the ballpark site on the waterfront.

The Bay Area varies greatly in its topography and development pattern. The Peninsula and East Bay cities tend to concentrate urban development toward the flatter portions of the Bay plain, away from local hillsides. Similarly, the most intensely developed portion of San Francisco, including the Downtown area and Financial District, is located within the flatter portions of the City about one mile north to northwest of the ballpark site.

The San Francisco waterfront as a whole defines the urban edge of the eastern and northern portions of the City. The overall character of the waterfront varies by land uses and geographic location. The visual quality can be assessed through consideration of building height, bulk and architectural style as urban design elements; pedestrian areas and amenities; open spaces and view corridors.

The Embarcadero roadway along the waterfront is in the process of being reconstructed. When completed, this roadway will stretch from King Street in the area known as Mission Bay in the south, to Fisherman's Wharf in the north, a distance of three and one-half miles.

The Embarcadero improvements include roadway repaving, tree planting, construction of major pedestrian pathways, and development of a MUNI Metro right-of-way in the median. Removal of the elevated Embarcadero freeway structure since the 1989 Loma Prieta earthquake has enhanced the visibility of the Bay and the Bay Bridge, Yerba Buena Island, Treasure Island, and buildings of the downtown area north of Market Street. The ballpark site is in the south portion of The Embarcadero project that effectively serves as the southern entrance and/or exit to The Embarcadero.

Streetscape features installed along The Embarcadero include specialty lamp posts, bollards, benches, tree planters, railings, decorative cobblestone pavers and concrete sidewalks with colorful signage. Street trees along the length of The Embarcadero, consisting of sycamores and palms together with the pedestrian amenities are intended to create a sense of visual continuity. These design features generally carry through along King Street on the north side of the proposed ballpark site, west from the southern terminus of The Embarcadero.

Surrounding Areas

South of Market

The proposed ballpark site is located about a mile south of Market Street, a major urban street in the northeast portion of San Francisco. Much of the area known as South of Market is differentiated from the Downtown area and Financial District north of Market Street by virtue of the scale, age, architectural style and uses of the buildings.

While some new buildings have been constructed in recent years, particularly the Moscone Convention Center and Yerba Buena Gardens, much of the area south of Market retains its predominantly manufacturing, light-industrial and warehousing appearance. Buildings tend to be of roughly equal width, height and depth giving a "boxy" appearance to individual structures. Ornamentation consisting of cornices (decorative wall crowns), columns, pillars

or sills is lacking and older structures rarely exceed four stories in height as compared to the high-rise (20 stories or more) buildings near and north of Market Street. Although various portions of the South of Market area have undergone redevelopment, the overall appearance of the area tends to remain utilitarian.

South End Historic District

Parts or all of the five blocks across King Street north and northeast of the proposed ballpark site are designated as the South End Historic District.[1] This historic district is an important visual landmark for the City as a whole and representative of the development of warehouses and industrial buildings over a 120-year period. The buildings in the district are of typical warehouse design, large in bulk, often with large arches and openings originally designed for easy rail or truck access. The large number of intact masonry warehouses in the district are reminders of the maritime and rail activities at the turn of the century. (Please see Appendix A, Initial Study, pp. A.41 - A.44, for more detailed information concerning historic architectural resources in the project vicinity.)

Rincon Point - South Beach

The proposed ballpark site lies immediately adjacent to the southwest edge of the South Beach subarea of the Rincon Point - South Beach Redevelopment Plan Area. The proposed project includes an amendment to the *Rincon Point - South Beach Redevelopment Plan* to expand the Plan area to include the ballpark site. This redevelopment area currently includes approximately 2,500 residential units, with accessory retail and commercial spaces at the street level. Open space in South Beach Park and the 700-berth South Beach Harbor for recreational boaters, and a small building containing the offices of the Ship Clerks Association are immediately east of the proposed ballpark site. The harbor and 800-ft.

public access way form the focal point of the area, contributing to the maritime character of the waterfront in the South of Market area.

The character of this redevelopment area (Figure III.C.1A) contrasts in architectural form and style with the mix of pier structures and accessory buildings along the east side of The Embarcadero, and the north side of King Street. Several four-story residential buildings are located along the west side of The Embarcadero. The bulk of these buildings appears to fill their roughly triangular-shaped lots, and provide visual continuity along the west side of The Embarcadero through common design themes and similar height and bulk.

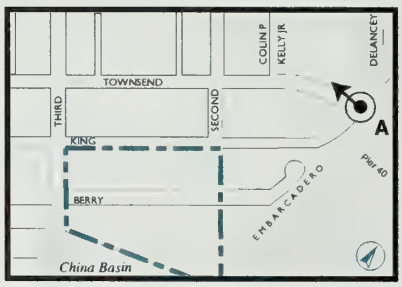
South Beach Park, adjacent to South Beach Harbor, is immediately northeast of the project site (see III.B. Land Use, pp. III.29 - III.30 for additional information regarding South Beach Park). The park contains a lawn area with benches along the waterfront that provide views of the harbor and Bay. The park also has an approximately 40-ft.-high red steel sculpture by Mark di Suvero that terminates views near the foot of King Street (see Figure III.C.1B). The park extends from the south end of The Embarcadero, forming a pedestrian transition between The Embarcadero and the ballpark site.

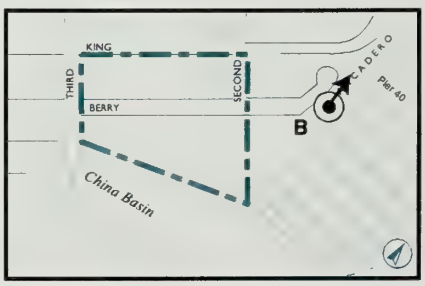
China Basin

The ballpark site consists of two city blocks that face the China Basin Channel. The Channel extends past the site for about one-half mile southwest from the Bay to Seventh Street (see II. Project Location, Figure II.C.1, p. II.5). The CalTrain commuter terminal is located one block west of the site. As a whole, the China Basin area with its low-rise structures contrasts visually with surrounding elements in the vicinity, such as Potrero Hill and elevated overpasses of Interstates 280 (I-280) and 80 (I-80) to the southwest and north respectively, high-rise buildings in the Financial District and the San Francisco Bay Bridge towers. Other prominent features in the immediate area of China Basin include industrial buildings of the Mission Bay area south of the China Basin Channel.

Figure III.C.1A: South Beach Marina Apartments, The Embarcadero and Townsend Street

Figure III.C.1B: South Beach Park and Sculpture





SOURCE: EIP Associates

GIANTS BALLPARK

● Figure III.C.1 Surrounding Areas
A: South Beach Marina Apartments, The Embarcadero and Townsend Street
B: South Beach Park and Sculpture

King Street, from The Embarcadero to Fourth Street, and areas adjacent to the ballpark site include streetscape and MUNI Metro right-of-way improvements as described above. South of China Basin Channel, an industrial and warehouse character dominates the visual setting, with cranes, other industrial structures, large maintenance and storage yards, active maritime uses, warehouses, boat docks and railroad tracks.

Project Site and Adjacent Blocks

The proposed ballpark site is currently developed with 11 low-rise light-industrial buildings. The most prominent structure is the large building on Pier 46B, which is two stories high and is on the south side of Berry Street. Other buildings on the site are one- and two-story industrial/commercial buildings fronting King Street and the north side of Berry Street. The buildings are rectangular in appearance and are generally composed of concrete and stucco. Portions of similar older industrial buildings also exist on the south side of King Street. Exposed building walls remain from the partial demolition that took place for the widening of King Street.

The overall character of the project site is of one- to two-story warehouse and light-industrial buildings. The buildings share similar architectural details, but vary in terms of architecture, age, size, and scale. The Pier 46B building occupies the entire block bounded by Berry Street, Second Street, Third Street, and China Basin Channel. Although the height of the Pier 46B building on the south side of Berry Street is about the same as other adjacent structures, the building's mass as defined by its length, width and height appears greater than the structures on the opposite side of the street. The buildings on the north side of Berry Street are newer and more individual in color and massing. All share facades that are rectangular in shape with predominantly flat roofs, and are built up to the edge of the road without setbacks. Facades are without texture or much detail.

A recent study, Port of San Francisco Historic Resources Data Base, November 1996, provides information on potential historic resources in Port of San Francisco jurisdiction.[2] The report notes that the seawall, extending from the foot of Taylor Street on the northern waterfront to South Beach Harbor has been determined eligible for the National Register of Historic Places. The bulkhead at Pier 46B in China Basin Channel is not part of the historic seawall. The report also identifies a potential non-contiguous National Register historic district, consisting of resources, primarily waterfront bulkhead and pier buildings, from Fisherman's Wharf to Pier 48. According to the database cited above, the Pier 46B buildings on the project site appear ineligible for that district, because of lack of significance. The Pier 38 buildings, on The Embarcadero near First (Delancey) Street, about two blocks north, are the closest structures to the ballpark site considered eligible for the district. (Please see Appendix A, Initial Study, pp. A.41 - A.44, for more detailed information concerning historic architectural resources in the project vicinity.)

Although the Pier 46B building is larger in scale than the smaller buildings across the street on the north side of Berry Street, it is consistent in mass and shape with the two China Basin buildings west of Third Street. Like the Pier 46B building, the China Basin buildings are rectangular in shape and together occupy about the same volume and area as the Port building. The China Basin Building is a six-story former warehouse fronting China Basin Channel from Third Street to Fourth Street. Originally constructed in 1921, this building was recently renovated. The three-story China Basin Landing Building adjacent to the China Basin Building fronting on Berry Street was constructed within the last five years.

The structures on the north side of King Street across from the project site have varied architectural designs. The Townsend building at 95 Berry Street and the adjacent State Terminal Annex building are older brick construction. Most buildings on King Street are about two stories high; the State Terminal Company building is three stories, and the Townsend building is six stories high.

Maritime equipment and materials stored on the China Basin side of the project site impart a utilitarian appearance to the setting. This portion of the project site is highly visible from the Lefty O'Doul Bridge at Third Street, a bascule drawbridge which is considered eligible for listing on the National Register of Historic Places. The Lefty O'Doul Bridge is a visually prominent structure adjacent to the project site. The Lefty O'Doul Bridge on Third Street and the Peter Maloney Bridge at Fourth Street flank the China Basin Building. The bridges are considered unique engineering structures. Both are bascule bridges with steel framework and counterbalances (devices that lower one end of the bridge as the other end is raised).

VIEWS

View corridors are defined as physical elements such as buildings and structures that guide lines of sight and control view directions available to pedestrians and motorists. Existing views of the waterfront in the immediate vicinity of the ballpark site are limited because of buildings in the area which obstruct views to the Bay and to China Basin. Excluding views from Pier 46B itself at the south edge of the proposed ballpark site adjacent to China Basin, views towards the Bay from the project site are limited. There is currently no public access to Pier 46B.

Views From or Near Proposed Ballpark Site

The proposed ballpark site affords several prominent views to off-site areas, including the skyline of downtown San Francisco and the Financial District to the north; the South Beach Marina Apartments, other industrial and office buildings surrounding the ballpark site and China Basin Channel, the Lefty O'Doul Bridge and the Bay to the south and east. The view north from the intersection of Berry and Second Streets at the east end of the proposed ballpark site includes the South Beach Marina Apartments and partial views of downtown high-rises.

King Street bounds the site on the northwest. King Street visual conditions include recent widening, repaving, new sidewalks and street trees completed in concert with reconstruction of The Embarcadero (see Figure III.C.2A). The King Street view corridor is defined by the presence of the MUNI Metro light rail system tracks in the median, and rows of street trees in the median and on each sidewalk.

The King Street view corridor is more open than the Berry Street corridor, because King Street has a wider roadway and is more open due to the partially demolished buildings on the south frontage. Views north from Second and King Streets are similar to the views available from Second and Berry Streets. There are no water views available from King Street near the project site because of existing buildings which block views toward China Basin and the Bay. Views from Berry Street within the site include existing buildings to be demolished (see Figure III.C.2B).

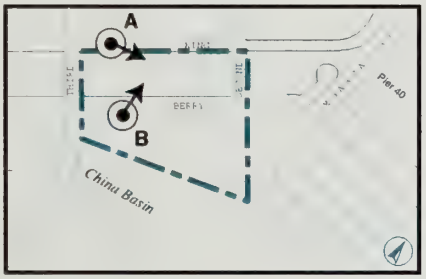
From Third Street near Berry Street looking northwest, views of existing buildings on the project site, other low-rent development South of Market Street, and the downtown skyline are visible (see Figure III.C.3A). From Berry Street near Second Street, views of new development in South Beach and of the downtown skyline are available (see Figure III.C.3B).

Views of the Proposed Ballpark Site

Views toward the east from the Lefty O'Doul Bridge include views of tugboats, maritime equipment and materials stored on the China Basin side of the project site, which impart a utilitarian appearance to the setting (see Figure III.C.4A). Views toward the east and south from the Lefty O'Doul Bridge include the Bay, portions of the South Beach Harbor and the cities of Oakland and Alameda in the distance, China Basin and the Mission Bay area. From the breakwater-fishing pier at the southerly end of South Beach Harbor, views are available of the Lefty O'Doul Bridge, China Basin and the existing Pier 46B building on the project

Figure III.C.2A: View East Along King Street Opposite Project Site

Figure III.C.2B: Project Site Buildings as Seen from Berry Street Looking North



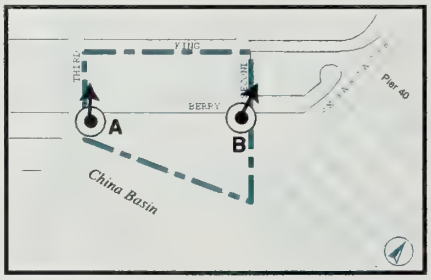
SOURCE: EIP Associates

GIANTS BALLPARK

Figure III.C.2 Views of Project Site
A: View East Along King Street
B: View North from Berry Street

Figure III.C.3A: View North from Berry and Third Streets

Figure III.C.3B: View North from Second and Berry Streets



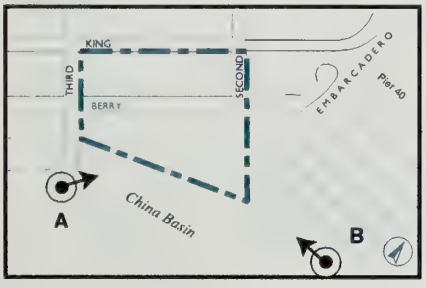
SOURCE: EIP Associates

GIANTS BALLPARK

Figure III.C.3 Views from Project Site
A: View North from Berry and Third Streets
B: View North from Second and Berry Streets

Figure III.C.4A: View of Pier 46A East from Lefty O'Doul Bridge

Figure III.C.4B: View Looking West from South Beach Harbor



SOURCE: EIP Associates

GIANTS BALLPARK

● Figure III.C.4 Views of Project Site
A: View of Pier 46A East from Lefty O'Doul Bridge
B: View West from South Beach Harbor

site (see Figure III.C.4B). Views from Third Street (see Figure III.C.5) adjacent to the proposed ballpark site include the Lefty O'Doul Bridge, and the China Basin Landing buildings immediately west of the site.

The east portion of the proposed ballpark site is visible from South Beach Park and the Dolph P. Rempp Sailing Ship Restaurant on the waterfront promenade at South Beach Park. The eastern portion of the Pier 46B building on the ballpark site is visible, but partially shielded by the Ship Clerks Association building and surrounding trees.

The proposed ballpark site is visible from the south end of The Embarcadero near Townsend Street (see Figure III.C.6). The eastern portion of the site can be viewed behind the di Suvero sculpture and to the west.

Potrero Hill

Figure III.C.7 shows the view of the project site from Vermont Street between Eighteenth and Nineteenth Streets on Potrero Hill. The view includes the downtown skyline, the I-280 freeway ramps, and the Bay Bridge. The Mission Bay driving range and the China Basin Building are also visible. Treasure Island is seen north of the Bay Bridge.

Bay Bridge and Elevated Freeways

The ballpark site is briefly visible from the Bay Bridge at the passenger vehicle level in the westbound direction of travel. Most views of the site from the bridge are limited due to the bridge structure itself. The general vicinity of the project area is visible for a distance of approximately three-tenths of a mile on the west end of the bridge span west of Yerba Buena Island. China Basin, the top of the Lefty O'Doul Bridge and the China Basin Building can be distinguished from that vantage point.

SOURCE: Square One Productions

GIANTS BALLPARK

Figure III.C.5 View of Project Site: View Southeast from Third Street at Townsend Street

SOURCE: Square One Productions

GIANTS BALLPARK

● Figure III.C.6 View of Project Site:
View Looking South from The Embarcadero (Herb Caen Way) at Pier 40

SOURCE: Square One Productions

GIANTS BALLPARK

Figure III.C.7 View of Project Site: View to Northeast from Roof of International Studies Academy at 693 Vermont Street, Between 18th and 19th Streets

NOTES - Visual Quality and Lighting

1. City and County of San Francisco, Article 10: Preservation of Historical, Architectural and Aesthetic Landmarks, and Article 11: Preservation of Buildings and Districts of Architectural, Historical and Aesthetic Importance in the C-3 Districts, of the Municipal Code Part II, Chapter II, Planning Code, as adopted January 26, 1967 (Article 10) and September 17, 1985 (Article 11), and amended through March 1994.

2. Port of San Francisco Historic Resources Data Base, prepared by Architectural Resources Group, November 1996. A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

D. SHADOWS AND WIND

SHADOWS

The ballpark site is within an area of piers, warehouses and related industrial uses. Current or proposed open space uses in the vicinity of the project include: the South Beach Marina, the South Beach Park and a proposed extension and the Promenade (all east of the project site), and South Park, located to the northwest between Brannan, Bryant, Second and Third Streets. The open spaces on the waterfront are not under the jurisdiction of the San Francisco Recreation and Parks Commission and are not, therefore, subject to the shadow restrictions of City Planning Code Section 295, the Sunlight Ordinance. South Park, about three blocks northwest of the project site, is the closest property to the ballpark subject to Section 295.

The existing warehouse and Pier 46B buildings on the site and other neighboring buildings cast shadows on streets and sidewalks in the project vicinity. Project-related shadow patterns for various times of the day and year are discussed in detail in IV.D. Shadows and Wind, pp. IV.46 - IV.74.

WIND

U.S. Weather Bureau and Bay Area Air Quality Management District data show that westerly (i.e., from the west) to northwesterly winds are the most frequent and strongest winds during all seasons in San Francisco.[1] Of the 16 primary wind directions measured at a Weather Bureau station at the United Nations Plaza (at a height of 132 ft.), four directions comprise the greatest frequency of occurrence as well as the majority of strong wind occurrences; these are northwest, west-northwest, west and west-southwest winds. Calm conditions occur about 2 percent of the time.

Average wind speeds are the highest during summer and lowest during winter. Strongest peak winds, however, occur in the winter, when speeds of 47 miles per hour (mph) have been recorded.[2] The highest average wind speeds occur in the mid-afternoon, and the lowest occur in the early morning.

Pedestrian Comfort and Wind Criteria

Wind conditions partly determine pedestrian comfort on sidewalks and in other public areas. Large buildings can redirect wind flows around and down to street level, resulting in increased wind speed and turbulence at street level. In order to provide a comfortable wind environment for people in San Francisco, the City established specific comfort criteria to be used in the evaluation of proposed buildings in certain areas of the City. The City Planning Code specifically outlines these criteria for the Downtown Commercial (C-3) District and each of the Rincon Hill, Van Ness Avenue, and South of Market areas [Sections 148, 249.1(a)(3), 243(c)(8), 263.11(c)]. There are no specific comfort criteria in the City Planning Code that would apply to the ballpark site.

The comfort criteria are based on pedestrian-level wind speeds that include the effects of turbulence, referred to as "equivalent wind speeds." For example, Section 148 of the City Planning Code establishes an equivalent wind speed (as defined in the Code) of 7 mph in seating areas and 11 mph in pedestrian areas as comfort criteria. New buildings and additions to buildings may not cause ground-level winds to exceed these levels more than 10 percent of the time year round between 7:00 a.m. and 6:00 p.m.[3] If existing wind speeds exceed the comfort level, new buildings and additions must be designed to reduce ambient wind speeds to meet the requirements. Section 148 also establishes a hazard criterion, which is a 26-mph-equivalent wind speed for a single full hour per year. Buildings may not cause winds that meet or exceed this criterion.[4] While the standards of Section 148 do not apply to the project, its standards have been selected as providing appropriate methodology and criteria for the analysis of wind effects for purposes of this EIR.

Existing and project-generated wind conditions are discussed in IV.D. Shadows and Wind, pp. IV.46 - IV.74. As described therein, the pedestrian comfort criterion is currently exceeded at 39 of 46 test locations, and the hazard criterion exceeded at two locations.

NOTES - Shadows and Wind

1. The U.S. Weather Bureau data used in this analysis were originally gathered at the weather station atop the Old Federal Building at 50 United Nations Plaza during the years 1945-1950. Data were taken hourly, annually for 16 wind directions. The data base, comprised of 32,795 hourly observations, is of sufficient length to provide a reliable estimate of future wind conditions in San Francisco.

2. E. Jan Null, *Climate of San Francisco*, NOAA Technical Memorandum, *NWS WR-126*, February 1978.

3. The City Planning Code specifies the hours of 7:00 a.m. to 6:00 p.m. The available weather data cover the hours of 6:00 a.m. to 8:00 p.m. Thus, observations from two additional evening hours and one additional morning hour are included in these data.

4. Due to the way the hazard criterion is stated, it is most appropriate to report exceedances of this criterion in terms of the number of hours per year that the excess occurs, rather than the wind speed. Thus, for each wind analysis, the number of locations and the total sum of the durations of exceedances of the hazard criterion are important measures of effect. This differs from reporting of both comfort criteria, for which wind speeds exceeded 10 percent of the time are examined and presented, but wind speeds are not summed.

E. TRANSPORTATION AND CIRCULATION

INTRODUCTION

This section describes the facilities and systems that currently comprise the local and regional transportation network serving the proposed project. These facilities and systems include a multi-faceted network of local streets, ramps and freeways; local and regional bus and rail transit lines; parking areas; bicycle and pedestrian facilities; and truck loading areas. This Setting section describes: 1) the transportation study area; 2) existing regional and local transportation facilities and services that serve the project study area; and 3) existing transportation conditions. Figure III.E.1 shows the regional transportation facilities serving the City and County of San Francisco in relation to the project site.

The information in this section was summarized from the *Transportation Background Report for the San Francisco Giants Ballpark at China Basin*, dated March 1997, which was prepared under the direction of the San Francisco Planning Department. A copy of the Transportation Background Report and all related background information, including data and calculation sheets, are available in the project files at the Office of Environmental Review, Planning Department, located at 1660 Mission Street in San Francisco.

TRANSPORTATION STUDY AREAS

The transportation study area shown in Figure III.E.2, p. III.61, includes all aspects of the transportation network that may be measurably affected by project traffic. The transportation study area is defined by travel corridors and by facilities such as transit stations. It includes the freeway segments, freeway ramps, street segments, and street intersections that project patrons would use in traveling to and from the ballpark or other uses on the project site.

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure III.E.1 Regional Transportation Setting

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure III.E.2 Transportation Study Area

The scoping of the study area also took into account the proposed location of parking designated for use by the ballpark south of the China Basin Channel, and the fact that ballpark patrons would be expected to use the available on-street and off-street parking within a reasonable walking distance of the ballpark. In addition, the study area encompasses the various public transit modes—rail, bus, and ferry—that would potentially serve the ballpark.

Traffic Study Area

The "traffic study area" is a component of the transportation study area. Figure III.E.2, p. III.61, indicates the intersections and arterial street segments that were included in the traffic study area. The selected intersections encompass the primary and the secondary access routes to and from both the ballpark site and the areas where ballpark parking would occur. The arterial street segments that were selected are portions of the arterials designated in the San Francisco Congestion Management Program (CMP) network that are included in the transportation study area and are defined by intersections included in the traffic impacts analyses.

Several additional intersection locations beyond the transportation study area were included in the traffic analysis as shown on the regional setting map (Figure III.E.1, p. III.60). These intersections include Broadway and The Embarcadero, which would be used by some drivers heading to and from the northeast part of the City and North Bay counties; Third and Cesar Chavez Streets, which would be used by drivers going to the South Bayshore and Visitacion Valley areas of the City and to Peninsula and South Bay cities, and is used by Giants fans before and after ballgames at 3Com Park; and Third and Jamestown Streets, which is congested before and after Giants ballgames at 3Com Park.

Transit Study Area

All regional and local San Francisco Municipal Railway (MUNI) transit services which have stops or stations in the local study area were evaluated and are included within the study area reflected in Figure III.E.2, p. III.61. These include rail services such as BART, CalTrain, and MUNI Metro; bus services such as MUNI, AC Transit, SamTrans, and Golden Gate Transit; and the ferry services provided by Golden Gate Transit and private ferry operators (i.e., Red & White Fleet, Harbor Bay). Other modes such as charter buses and Amtrak were also considered.

Parking Study Area

Parking north of the China Basin Channel is divided into zones, as shown in Figure III.E.3, which represent average walking times from parking spaces to the project site (i.e., a 5-, 10- or 15-minute walk). The area which includes parking spaces within a 15-minute walk of the ballpark is the outer boundary of the "parking study area." These walking times are approximate as they will vary with each individual, the actual route walked, and the time of day and weather conditions. South of the Channel, the Giants propose to provide approximately 5,000 parking spaces dedicated for ballpark use. The remainder of the area south of the China Basin Channel and within a 15-minute walk from the ballpark is within the Mission Bay project area. Because of development plans for this area, the parking study takes a conservative approach and does not assume that there will be parking available for the ballpark within the Mission Bay project area, with the exception of the approximately 5,000 parking spaces dedicated for the Giants parking.

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

● **Figure III.E.3 Parking Study Area**

Pedestrian Study Area

The pedestrian study area includes all walkways in the blocks immediately surrounding the project site, together with pedestrian routes to the major parking facilities and areas, and routes leading from the project site toward the following transit stations: Second/King median MUNI Metro light-rail station, Ferry Building ferry terminal, Embarcadero BART/MUNI station, Montgomery Street BART/MUNI station, Transbay Transit Terminal, and CalTrain Depot. Bicycle travel conditions were also evaluated within the same study area.

EXISTING REGIONAL TRANSPORTATION FACILITIES

Travel to and from the project study area involves the use of regional transportation facilities, highways and transit that link San Francisco with other parts of the Bay Area and northern California.

Regional Freeways

As shown in Figure III.E.1, p. III.60, the project study area is served by three freeways: 1) U.S. Highway 101 (U.S. 101) to and from the South Bay, and the North Bay via the Golden Gate Bridge, 2) Interstate 80 (I-80) to and from the East Bay via the Bay Bridge, and 3) Interstate 280 (I-280) to and from the Peninsula and South Bay areas ending at Sixth and Brannan Streets and, by mid-1997, via ramps ending at Fifth and King Streets two blocks west of the project site. Regional access to the project study area from each travel direction via the freeway network is summarized below.

Freeway operating conditions are described in terms of both speed and Level of Service (LOS). LOS is ranked from A to F, with A representing very good conditions, and F representing the worst, most congested conditions (see Appendix C, Table X.C.1, p. A.98 for

definitions of freeway levels of service). LOS D is generally considered acceptable under San Francisco's dense urban conditions. Service levels for freeway segments were obtained from California Department of Transportation (Caltrans) files for 1996 and from the San Francisco Congestion Management Authority.

U.S. Highway 101

U.S. 101 serves travelers to/from North Bay areas via the Golden Gate Bridge, and to/from the San Francisco Peninsula and South Bay areas. There is no direct freeway connection to the Golden Gate Bridge for northbound travelers; therefore, regional access is provided by surface streets in the northern part of San Francisco.

U.S. 101 south of the project study area provides access to 3Com Park at Candlestick Point as well as the project site. Access to and from U.S. 101 south of the project study area is provided at Third Street, I-280, Cesar Chavez Street, and Vermont/Mariposa Streets (northbound off-ramp only), as well as from I-80 westbound. The number of through lanes on U.S. 101 varies from two in each direction (near the I-80/Central Freeway interchange) to five in each direction (between Cesar Chavez Street and I-280), with most of the route four in each direction. The primary bottleneck on northbound U.S. 101 is at the Cesar Chavez Street interchange where the number of freeway lanes is reduced by one at the off-ramp. This occurs just north of the merge of traffic from northbound I-280 into northbound U.S. 101, causing traffic congestion south of this point. The U.S. 101/I-80 interchange is an additional congestion point in both directions.

During the peak commute hour (4:30 to 5:30 p.m.), northbound U.S. 101 typically operates at LOS E south of Third Street, improving to 50 mph, LOS C[1] from Third Street to Cesar Chavez Street, then worsening to 20 mph, LOS F[2] from there to I-80. During the 3:30 to 7:30 p.m. period, southbound U.S. 101 typically operates at 35 mph, LOS E[3] from the I-80 split to the San Francisco city limit at Harney Way/3Com Park. The on- and off-ramps for

this section of U.S. 101 currently do not experience substantial congestion except on some game days at 3Com Park.

Interstate 280

Located south of I-80 and east of U.S. 101, I-280 provides access from the South Beach/China Basin area and the project study area to locations south of San Francisco, and is closer to these subareas than U.S. 101 and I-80. I-280 parallels U.S. 101 until crossing it at an interchange at Alemany Boulevard, where I-280 then follows a southwest direction through the City to points south on the Peninsula.

On-ramps to I-280 from the project study area include Sixth/Brannan Streets, Fifth/King Streets (under construction, scheduled to be open July 1997), Mariposa Street, and Cesar Chavez Street. Off-ramps to the project study area include Cesar Chavez Street, Mariposa Street, Fifth/King Streets (under construction, scheduled to be open July 1997), and Sixth/Brannan Streets. The basic number of through lanes on I-280 varies from two lanes on the ramps near the project study area to three and four lanes each direction south to U.S. 101.

Both directions of I-280, south of the Fourth Street/Sixth Street split, operate at 50 mph, LOS D[4] or better during the 4:00 to 6:00 p.m. period. The on- and off-ramps for this section of I-280 currently are not congested; however, queuing often occurs on the off-ramps at Fourth Street and Sixth Street due to congestion at the intersections of the freeway ramps with these streets.

Interstate 80

I-80 provides access to the project study area from the East Bay via the Bay Bridge. While I-80 technically ends by the Central Freeway and becomes U.S. 101, the motorist perceives

this as one continuous route. The basic number of through lanes on I-80 is five lanes on the Bay Bridge and four lanes on the elevated Skyway section between the Bay Bridge and the interchange with U.S. 101. However, there are some critical sections of I-80 on the Skyway where only three travel lanes are provided.

Three off-ramps would serve westbound project traffic from the I-80/Bay Bridge into San Francisco: Fremont Street mid-block between Folsom and Howard Streets, Fremont and Harrison Streets, and Fifth and Harrison Streets. East Bay traffic traveling directly to the project site would likely use the Fremont and Harrison Streets off-ramp, turning east to use The Embarcadero roadway or west to use Second Street. East Bay traffic traveling to off-site parking facilities would likely use any of these three available off-ramps from westbound I-80.

The I-80/Bay Bridge eastbound on-ramps are at Fifth/Bryant Streets, Sterling Street near Second Street, Essex/Harrison Streets, and First/Harrison Streets. The most direct route from the project site to eastbound I-80/Bay Bridge is via Second Street to the Sterling Street on-ramp; use of the Sterling Street ramp is restricted to vehicles with three or more persons between the hours of 3:30 and 7:00 p.m. on weekdays. Alternate access to eastbound I-80/Bay Bridge is provided from the project site via either Second Street to the Harrison/ Essex Street on-ramp or via The Embarcadero to the Harrison/First Street on-ramp.

Eastbound I-80 during the 3:30 to 6:30 p.m. period typically operates at 30 to 35 mph, LOS E,[5] from the U.S. 101 merge to Treasure Island. Caltrans reports that average travel speeds in this section of eastbound I-80 drop under 35 mph from 3:45 to 6:30 p.m. At the 5:30 p.m. peak, speeds drop to 10 mph[6] in the eastbound direction up to Sterling Street, gradually increasing to 25 mph on the Bay Bridge. After 6:30 p.m., travel speeds on eastbound I-80 typically increase above 50 mph, LOS C. Westbound I-80 during the 3:30 to 6:30 p.m. period typically operates at 45 mph, LOS D[7] from Treasure Island to Fifth Street; worsening to 20 mph, LOS F[8] from Fifth Street to the U.S. 101 split. For the section of westbound

I-80 from Fifth Street to U.S. 101, average speeds remain below 35 mph from 3:15 to 6:30 p.m.[9] After 6:30 p.m., westbound I-80 speeds increase above 50 mph, to LOS C.

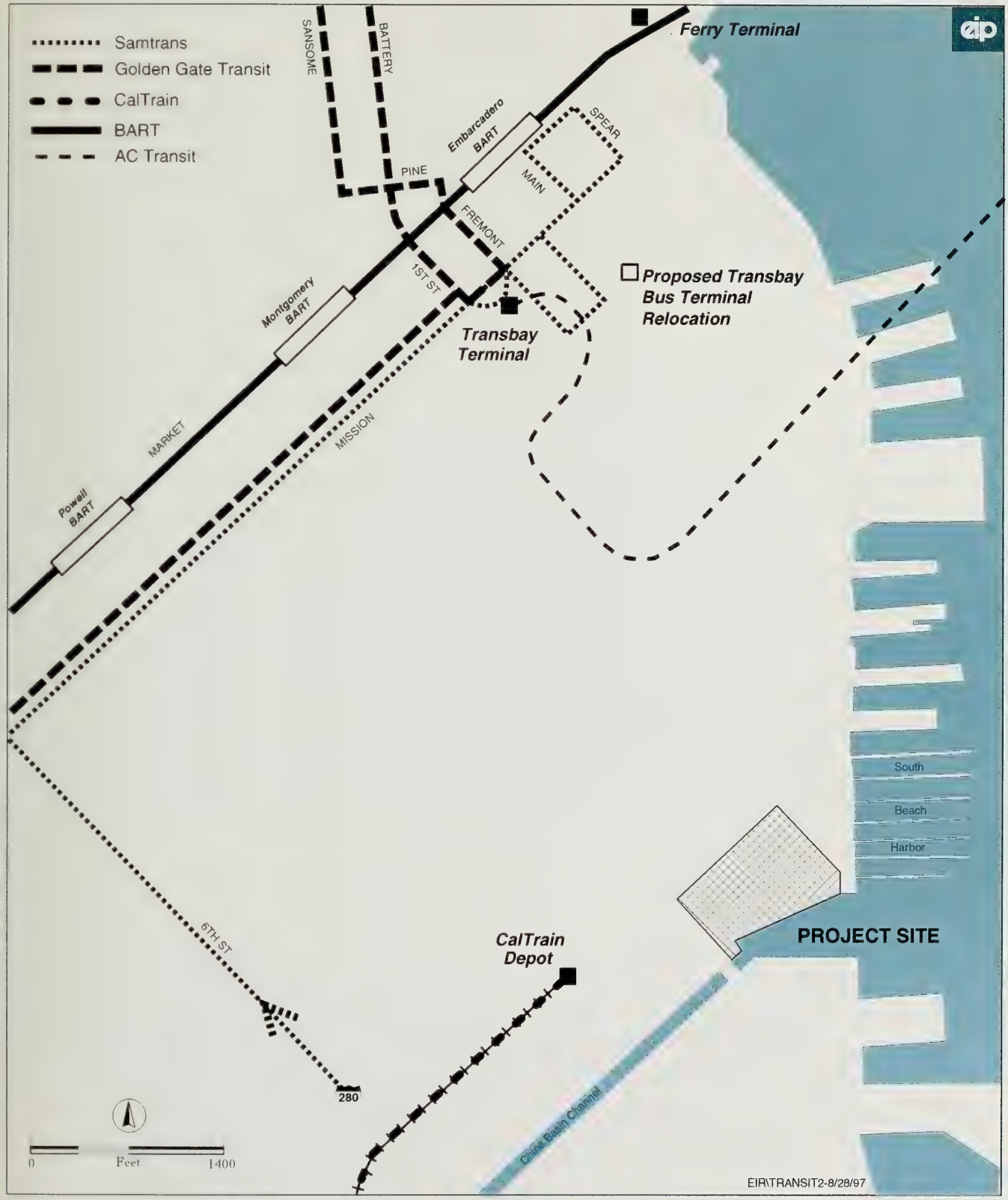
The I-80 ramps connecting downtown San Francisco with eastbound I-80/Bay Bridge are typically congested during the 3:00 to 7:00 p.m. time period. Shorter periods of congestion are experienced at ramps connecting downtown with westbound I-80 and southbound I-280. While traffic on the Sterling Street High Occupancy Vehicle (HOV) ramp is slow at its merger with traffic on the Bay Bridge when the bridge is congested, the ramp is lightly used and has capacity for more HOVs.

Regional Transit Systems

San Francisco is served by a variety of regional transit systems and operators including bus, rail, and ferry. Figure III.E.4 shows the services provided by regional transit operators to the project study area. Following is a discussion of the transit operators and the services that are currently provided.

CalTrain

The CalTrain Depot, located at Fourth and Townsend Streets, is a seven-minute, 1,000-foot (ft.) walk from the project site. CalTrain Peninsula Commute Service operates 30 southbound and 30 northbound trains each weekday from the Depot. CalTrain operates 13 round trip trains on Saturday and nine round trip trains on Sunday. Off-peak trains generally consist of four 140-passenger cars and peak period trains have four to five 140-seat cars. CalTrain provides existing services that would offer convenient arrival and departure schedules for most weekday afternoon and weekend day games. CalTrain will expand service by six weekday and two Saturday trips on July 6, 1997.



SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

● Figure III.E.4 Existing Regional Transit

For time periods coinciding with weeknight games at the project site, train arrivals are provided every 20 minutes; however, the last train leaves the CalTrain Depot at 10:00 p.m. on weekday nights, which is earlier than the expected average game-ending time of 10:30 p.m. On Friday and Saturday nights a train leaves the depot at midnight, considerably later than the end of most night ballgames.

SamTrans

SamTrans operates the trunk of its basic San Francisco service along Mission Street from Ninth Street to Spear Street. Routes 1F, 47F, and 49F operate on 6th Street to I-280. Midday service is provided by two lines (7F, 7B) operating on 30 minute headways. Routes 1F, 47F, and 49F do not operate on weekends. Route 1F serves Pacifica via I-280. Routes 48F and 49F serve San Mateo and Foster City via I-280 and U.S. 101. The stop nearest to the ballpark is at the Transbay Terminal on Mission Street, about one mile from the project site or a 20-minute walk. It is likely that the service mix may change by the time the ballpark opens, as Samtrans is undertaking a System-wide Bus Evaluation Study.

BART

BART's Montgomery and Embarcadero Stations are located within about 1 mile of the project site (25-minute walk). The MUNI Metro connection from the project site to BART at the Civic Center, Powell, Montgomery, and Embarcadero Stations involves a station platform level change for patrons; passengers transferring between MUNI Metro and BART would go up one level to the mezzanine and then go down two levels to the BART platform because no direct connection exists between the MUNI and BART platforms. BART provides service until about midnight seven days a week. On weekdays, BART operates in both directions on about a five-minute headway in San Francisco until 7:00 p.m. (with more frequent service in peak periods) and then transitions to a ten-minute headway. On

Saturdays, midday headways are about seven minutes. Sunday headways are 20 minutes in San Francisco.

AC Transit

AC Transit provides direct bus service to the East Bay from San Francisco's Transbay Terminal which is located about 1 mile (20-minute walk) from the project site. Direct access is provided to the Bay Bridge from the Transbay Terminal, and AC Transit buses do not use local city streets in San Francisco. Most transbay service is commute-period and direction-oriented with only four routes providing midday/evening/weekend services (Routes F, L, N and T). Weekday afternoon commute services generally operate from 4:00 to 7:00 p.m. AC Transit headways during commute hours are 15 to 30 minutes on almost all routes, with two (SW and U) operating on 30- to 60-minute headways. Midday headways on routes providing midday services are 30 minutes. From 7:00 p.m. until midnight the headways on Routes F, L, and N are 30 minutes and the headway of Route T is 60 minutes. The funding for Route T, providing service to Treasure Island from San Francisco and the East Bay, is being eliminated by AC Transit. Route T is now operated by MUNI as the 108-Treasure Island line.

Golden Gate Transit

Golden Gate Transit service to the project site includes regularly scheduled bus services based at the Transbay Terminal and the regular ferry services based at the Ferry Building, both of which are approximately a 20-minute walk from the project site. Golden Gate Transit operates three basic bus services to San Francisco: Civic Center routes, Financial District routes, and Ferry Building feeder routes.[10] Many of the commute period buses remain in San Francisco during midday in a parking lot located at Folsom and Main Streets with an adjacent

transit stop on Main Street just north of Folsom Street (a 15-minute walk from the project site). The lot is leased month-to-month from the State of California (Caltrans).

Commute-hour Golden Gate Transit service to downtown San Francisco operates on headways of 30 minutes or less. Midday service headways are 30 minutes on all Marin to San Francisco Lines except for the 30 Line from San Rafael, which operates on 60-minute headways. Headways for the two lines serving the Ferry Building in San Francisco are 30 to 40 minutes during the morning and afternoon commute peak, when timed to meet ferry arrivals. Golden Gate Transit has recently implemented its plan to relocate its bus routes from Howard and Folsom Streets to Mission Street, with a layover stop on Folsom Street near Main and Spear Streets. Golden Gate Transit held public hearings on this proposal in late 1996; this service shift began in March 1997.[11]

Ferry Services

Golden Gate Ferry, Blue & Gold Fleet, and Harbor Bay Maritime provide ferry service to the San Francisco Ferry Terminal (Ferry Building). Golden Gate Ferry provides service to Sausalito and to Larkspur in the North Bay. Blue & Gold Fleet provides service to Tiburon. Blue & Gold Fleet provides service to Vallejo and to Oakland/Alameda, and Harbor Bay Maritime serves Harbor Bay Isle in Alameda.

On weekdays, Golden Gate Ferry provides roughly hourly service to Larkspur, with the last departure from San Francisco at 8:25 p.m. On weekends, the headways are about two hours and the last San Francisco departure is at 6:45 p.m. Sausalito headways are about 90 minutes on weekdays and weekends. The last weekday departure to Sausalito from San Francisco is 8:00 p.m. and the last weekend departure is 8:05 p.m. from May to September and 6:55 p.m. the rest of the year. In 1998 Golden Gate Ferry will add a new ferry to the San Francisco/Larkspur run. Although the exact schedule is not known at this time, this ferry could make weekday departures from San Francisco as late as 10:00 p.m..

Most weekend service to Tiburon operates from Fisherman's Wharf. On weekdays, some service to Tiburon operates from the Ferry Terminal and some from Fisherman's Wharf. Headways are about 60 minutes for this service. The last Ferry Building departure on weekdays is 7:15 p.m. and the last Wharf departure on weekends is 8:25 p.m.

The Vallejo ferry provides three weekday round trips to the Ferry Terminal; no late night service is provided. In the spring of 1997, Vallejo will introduce two new fast ferries operating more frequent service. Short-range as well as long-range plans envision a last boat departure from San Francisco at about 8:00 p.m.

The Blue & Gold Fleet currently provides service from Tiburon via both Pier ½ (Ferry Building) and Pier 43½ (Fishermans Wharf). On weekends a ferry from Tiburon arrives at 11:30 a.m. and departs at 4:45 p.m. Transit service between the project site and Pier 39 is provided by MUNI on the 32 bus. In the future, the MUNI Metro Extension (MMX) and F-line will also provide a link between Pier 39 and the project site.

Service to Harbor Bay Isle is generally hourly during weekdays with the last departure from San Francisco at 6:30 p.m. On weekends, service is reduced to only four roundtrips. Weekend service includes a 10:25 a.m. arrival in San Francisco and a 6:15 p.m. departure.

Harbor Bay Maritime presently operates one roundtrip to 3Com Park for some weekend games. Ballpark service is also provided by Blue & Gold Fleet on some weekends from Tiburon to 3Com Park.

EXISTING PROJECT AREA TRANSPORTATION FACILITIES

Local streets and intersections in the project area are shown in Figure III.E.2, p. III.61. Streets important to freeway and parking access are described below, followed by a summary of existing intersection levels of service. Local transit service to the project site is discussed

below, and service capacity is generally analyzed by corridors. Parking supply and occupancy of parking within a 15-minute walking distance is described. Pedestrian and bicycle access to the ballpark site is described, followed by existing freight-loading activities in the project vicinity.

Local Streets

The project study area is served by a grid street network with most major arterials spaced approximately 700 to 900 ft. apart. Designated major arterials[12] serving east-west traffic in the Project study area include King, Division, Bryant, Harrison and Folsom Streets. Designated major arterials serving north-south traffic include Potrero Avenue, The Embarcadero, and Second, Third, Fourth, Fifth, Sixth, Seventh, and Eighth Streets. Local roadways are described below. A summary of the key physical characteristics and designations for these roadways is presented in Appendix C, Table X.C.2, pp. A.100 - A.102. Although the street grid between Market Street and the project site does not follow a north-south or east-west orientation, conventional use in San Francisco is to refer to local roadways that are parallel to Market Street as east-west and the numbered streets as north-south, a convention that is used in this report.

King Street

King Street has been reconstructed between The Embarcadero and Third Street, in preparation for future service as the primary connection between I-280 and The Embarcadero. There are two travel lanes in each direction with parking permitted in the curb lane in most areas in both directions. King Street between Third Street and the I-280 ramps/Fifth Street is scheduled to be open to traffic by July 1997. MUNI Metro light-rail service will be provided in the median of King Street with stations at Second Street (in front of the project site) and Fourth Street. King Street is designated as a major arterial, a transit important street, a neighborhood pedestrian street and a citywide bicycle route in the City's *Transportation Element* of the *General Plan*. It is also part of the County Congestion

Management Program (CMP) network and the federally-designated "Metropolitan Transportation System."[13]

Townsend Street

Located one block north of the project site, Townsend Street serves primarily industrial and service commercial uses west of Second Street and a residential area in the block between Colin P. Kelly, Jr. Street and The Embarcadero. West of Third Street, Townsend Street is designated as a citywide bicycle route in the City's *Transportation Element*. It carries two-way traffic in an east-west direction with four travel lanes between Second and Fourth Streets and two lanes elsewhere. Townsend Street provides on-street, diagonal parking and also perpendicular parking in the residential area near The Embarcadero and at the CalTrain Depot between Fourth and Seventh Streets. While Townsend Street does not provide direct access to any regional roadways, it serves as a primary local street access to the CalTrain Depot at Fourth Street. A substantial number of pedestrians (approximately 600 per hour during peak periods) cross Townsend Street near Fourth Street. MUNI bus lines serving the CalTrain Depot and using Townsend Street include the 15, 30, 32, 42, 45.

Brannan Street

Located two blocks north of the project site, Brannan Street serves a mix of low-rise office, industrial and service commercial uses west of Delancey Street and a residential/retail area in the block between Delancey Street and The Embarcadero. The block between Fifth and Sixth Streets is part of the San Francisco County CMP network, a section that is also designated as a major arterial in the *Transportation Element*. Brannan Street carries two-way traffic in an east-west direction with four travel lanes west of Second Street and two lanes in the residential area between Delancey Street and The Embarcadero. Brannan Street provides

on-street, diagonal parking in the residential area between Delancey Street and The Embarcadero. It also provides access to I-280 via "touchdown" ramps at the intersection of Sixth and Brannan Streets. MUNI bus lines 15 and 42 use portions of Brannan Street. The 32 bus line also currently uses portions of Brannan Street while construction takes place along The Embarcadero.

Bryant Street

Located three blocks (a ten-minute walk) north of the project site, Bryant Street serves primarily retail commercial/residential-oriented uses west of Sterling Street and a residential area between Second Street and The Embarcadero. Bryant Street is designated as a major arterial, a transit important street between Third and Seventh Streets, and a secondary transit street between Seventh and Eleventh Streets in the City's *Transportation Element*. It is also part of the CMP network and the Metropolitan Transportation System. The three distinct segments of Bryant Street are summarized below:

- West of Sterling Street:
  - One-way eastbound;
  - Four basic through lanes;
  - Parking both sides.
- Sterling to Beale Street:
  - Two-way (HOV restriction westbound weekdays 3:30 to 7:00 p.m.);
  - Two lanes;
  - Parking south side only.
- Beale Street to The Embarcadero:
  - Two-way (no HOV restriction);
  - Two basic through lanes;
  - Parking north side only.

Bryant Street provides access to eastbound I-80/Bay Bridge via on-ramps at Fifth Street and at Sterling Street. Seventh and Fourth Streets provide off-ramps from eastbound I-80. In many respects, Bryant Street serves a frontage-road function for eastbound I-80, collecting and distributing traffic between the freeway and local roadway network. MUNI bus lines 9, 27, 42, and 80 use Bryant Street.

Harrison Street

Harrison Street is located on the north side of the I-80/Bay Bridge "skyway," more than one-half mile north of the project site. Harrison Street serves a mix of low- and mid-rise office, retail and residential buildings. It is designated as a major arterial, a transit-important street between Fourth and Seventh Streets, and a secondary-transit street between Seventh and 11th Streets in the City's *Transportation Element*. It is also part of the CMP network and the Metropolitan Transportation System. Harrison Street has four traffic lanes. It carries two-way traffic between Third Street and The Embarcadero and is one-way westbound west of Third Street.[14] Parking is permitted on both sides of Harrison Street. Harrison Street provides access to and from both directions of I-80 via the following ramps:

- Eastbound I-80 Bridge On-Ramps:
  - First Street;
  - Essex Street.
- Westbound I-80 On-Ramps:
  - Fourth Street;
  - Seventh Street;
  - Eighth Street.
- Westbound I-80 Off-Ramps:
  - Fremont Street;
  - Fifth Street.

Harrison Street serves a frontage-road function for westbound I-80, collecting and distributing traffic between the freeway and local roadway network. It also serves as a feeder route for downtown and South Beach traffic destined for eastbound I-80/Bay Bridge. MUNI bus lines 9, 14, 27, and 42 use Harrison Street.

Folsom Street

Located nearly two-thirds of a mile north of the project site, Folsom Street serves a mix of low- and mid-rise office, retail and residential buildings. It is designated as a major arterial and a bicycle route in the City's *Transportation Element*. It is part of the CMP network and the Metropolitan Transportation System. Folsom Street serves one-way traffic eastbound west of Main Street and two-way traffic between Main Street and The Embarcadero. It has four travel lanes; parking is permitted on both sides of the street. MUNI bus lines 12, 76, 80 and 82 use Folsom Street. Golden Gate Transit also uses Folsom Street, with a midday bus storage lot at the intersection of Folsom and Main Streets.

Sixteenth Street

Sixteenth Street extends in an east-west direction between Illinois Street and outer Market Street, connecting the project site with the Mission District, upper Market Street and Potrero Hill areas. Near the project study area, there are numerous vacant lots; further to the west, there are industrial and service commercial uses. Sixteenth Street is designated in the City's *Transportation Element* of the General Plan as a secondary arterial throughout its length. It is designated a transit-oriented street from Kansas Street west to Church Street, a neighborhood pedestrian street from Harrison Street west to Church Street on the west side of Potrero Hill, and a bicycle route between Third and Kansas Streets in the *Transportation Element*. It provides two-way traffic flow, with four travel lanes east of, and two lanes west of Pennsylvania Street. On-street parking is permitted west of Pennsylvania Street. MUNI

bus lines 22, 33 and 53 use Sixteenth Street. Service does not currently extend east of Henry Adams Street.

Mariposa Street

Mariposa Street extends from the northbound U.S. 101 off-ramp at Vermont Street past Third Street to the waterfront at China Basin Street. It serves primarily residential uses west of Mississippi Street. Mariposa Street is a two-way east-west street with four travel lanes east of I-280 and two travel lanes west of the freeway interchange. Access to and from the south on I-280 is provided via on- and off-ramps at Mariposa Street. The intersection at the off-ramp is signalized. Parking is permitted on both sides of Mariposa Street west of Mississippi Street. Mariposa Street is a signed bike route from Mississippi to Third Streets.

The Embarcadero

The Embarcadero follows the waterfront from the project site north to Fisherman's Wharf. It is being reconstructed as a landscaped expressway with at least two travel lanes in each direction, an exclusive transit right-of-way in the median, bicycle lanes and separated access and loading areas at piers in maritime use. The Embarcadero from King Street to Howard Street provides two travel lanes in each direction with curb parking provided in some areas. Construction of ultimate improvements along The Embarcadero, including the final roadbed and median light-rail facilities, is scheduled through the summer of 1997, and final designs are being prepared for the mid-Embarcadero improvements between Howard Street and Broadway. The Embarcadero is designated as a major arterial and a transit-important street in the City's *Transportation Element* and is part of the CMP network and the Metropolitan Transportation System. The Embarcadero is an access route to the project site from the Golden Gate Bridge via both Broadway and Bay Streets. MUNI bus lines 32, 80, 81 and 82 use The Embarcadero.

Second Street

Second Street extends 1 mile north of the project site to Market Street. The Montgomery BART and MUNI Metro stations are located on Market Street one block west of the intersection of Market and Second Streets at Montgomery Street. The Transbay Terminal is located one block east of the intersection of Mission and Second Streets. Walking time from the project site to these regional transit terminals is approximately 25 minutes. Second Street near the project site serves primarily low-rise buildings containing a mix of retail, residential and service commercial uses. Second Street is designated as a citywide bicycle route in the City's *Transportation Element* and provides four travel lanes with two-way traffic. Parking is permitted on both sides of Second Street. Second Street is an access route to the I-80/Bay Bridge eastbound on-ramp at Bryant/Sterling Streets (restricted to HOVs from 3:00 to 7:00 p.m. weekdays) and the on-ramp at Harrison/Essex Streets. Second Street also provides access to the Montgomery Street BART and MUNI Metro stations and is a relatively direct route between the project site and the Transbay Transit Terminal. MUNI bus lines 15, 42, and 80 operate on Second Street.

Third Street

From the project site, Third Street extends north to Market Street, a distance of 1 mile. The Montgomery BART and MUNI Metro stations are located on Market Street one block east of the intersection of Market and Third Streets. Walking time from the project site to Market Street is approximately 25 minutes. Third Street near the project site serves primarily low-rise buildings containing a mix of retail, residential and service commercial uses. South of Berry Street, Third Street crosses China Basin Channel over a four-lane historic bascule (lift) bridge known as the Lefty O'Doul Bridge, providing two traffic lanes in each direction. Third Street continues 4.5 miles south through the Mission Bay and Bayview/Hunters Point areas to an interchange with U.S. 101.

Third Street is designated as a major arterial, a transit important street, and part of the designated citywide pedestrian network in the City's *Transportation Element*. It is part of the CMP network and the Metropolitan Transportation System. Third Street north of Berry Street is a one-way northbound roadway providing four travel lanes plus parking on both sides. South of Berry Street, Third Street is a four-lane two-way street; south of the China Basin Channel it continues as a four-lane street with parking on both sides. Third Street provides access to U.S. 101 approximately 4.5 miles south of the project site, near 3Com Park. MUNI bus lines 15, 30, 45, 76, and 81 (a.m. peak only) operate on Third Street.

Fourth Street

Fourth Street extends from Third Street (south of the project site) north to Market Street, including a three-lane bascule bridge over China Basin Channel, providing two lanes southbound and one lane northbound. Fourth Street near the project site serves primarily low-rise buildings containing a mix of retail, office and service commercial uses. Fourth Street is designated as a major arterial, a transit important street, and a part of the designated citywide pedestrian network in the City's *Transportation Element*. It is part of the CMP network and the Metropolitan Transportation System. North of Townsend Street, Fourth Street is a one-way southbound roadway providing four travel lanes plus parking on both sides. Two-way traffic is carried on Fourth Street between Townsend Street and Third Street. MUNI buses provide service on the 15, 30, 45, and 76 lines along Fourth Street. An on-ramp at Harrison/Fourth and an off-ramp at Bryant/Fourth Streets provide access to and from the west via I-80. The CalTrain Depot is located at Townsend and Fourth Streets.

Fifth Street

Fifth Street extends from Townsend Street to Market Street. Near the project site, Fifth Street serves primarily low-rise buildings containing a mix of retail and service commercial

uses. The portion north of Brannan Street is designated as a major arterial and the portion north of Townsend Street is designated as a citywide bike route in the *Transportation Element*. The portion north of Brannan Street is part of the CMP network and the Metropolitan Transportation System. Fifth Street is a two-way roadway providing four travel lanes plus parking on both sides. It provides access to and from I-80/Bay Bridge via an on-ramp at Bryant/Fifth and an off-ramp at Harrison/Fifth Streets and provides access to the Powell Street station for MUNI Metro and BART. MUNI bus lines 27 and 42 use Fifth Street. In conjunction with the I-280 Touchdown Ramps project that Caltrans is sponsoring, Fifth Street will be developed for one block from King Street to Berry Street with an intersection at the I-280 ramp termini intersection.

Sixth Street

Sixth Street extends from Market Street to the existing I-280 touchdown ramps at Brannan Street. It serves primarily low-rise buildings containing a mix of retail and service commercial uses. Sixth Street is designated as a major arterial in the City's *Transportation Element* and is part of the CMP network and the Metropolitan Transportation System. Sixth Street is a two-way roadway providing four travel lanes plus parking on both sides; it also provides access to and from the south on I-280 via on- and off-ramps at Brannan/Sixth Streets. MUNI bus line 14 provides service on Sixth Street.

Potrero Avenue

Potrero Avenue extends from Brannan Street on the north to Cesar Chavez Street near U.S. 101 on the south, generally west of and paralleling the freeway. Potrero Avenue serves a mix of adjacent land uses, including San Francisco General Hospital, retail, residential and service commercial uses. It is designated as a major arterial and a secondary transit street in

the City's *Transportation Element* and is part of the CMP network and the Metropolitan Transportation System.

Potrero Avenue is a two-way roadway with six travel lanes and parking on both sides of the street. It provides access to U.S. 101 at Cesar Chavez Street south of the study area. MUNI bus lines 9 and 33 operate on Potrero Avenue.

Traffic Conditions

Existing traffic conditions were determined for the key local roadways and intersections in the study area. Level of service (LOS) is used to describe how a street segment or intersection operates. The method used for the intersection analysis generally defines LOS in terms of delay, which is the amount of time an average vehicle must wait before being able to pass through the intersection. This delay is expressed by letter designation from LOS "A," which signifies very low delays, to "F," which signifies excessive delay (over 60 seconds) conditions. A LOS of "D" (with delay in the range of 25 to 40 seconds) is the minimum acceptable operating condition for urban San Francisco streets. Level of service "E" and "F" generally represent unacceptable operating conditions. Further description of the LOS methodology is presented in Appendix C, pp. A.92 - A.96, and in the Background Transportation Report.

Arterial Analysis

Arterial levels of service were determined for key local roadways serving the project study area. These included those portions of the arterials located in the study area street network (see Figure III.E.2, p. III.61) that are part of the San Francisco CMP network and are monitored periodically to detect level of service problems. Roadway segments that worsen to LOS F require the preparation of a deficiency plan to identify measures that will be taken to

restore acceptable levels of service. It is important to note that arterial street segments that were already at LOS F when the CMP was adopted are not subject to the deficiency plan requirement.

During a weekday afternoon from 3:30 - 4:30 p.m., the hour that would be immediately after a weekday afternoon ballgame, the following arterials are currently at LOS F:

- Fourth Street between Market and Harrison Streets
- Fifth Street between Brannan and Harrison Streets, both directions
- Sixth Street between Brannan and Howard Streets
- Harrison Street between The Embarcadero and Fourth Street
- Bryant between Seventh and Fourth Streets

All of the other 13 arterial segments studied are at LOS D or better.

During the time period from 4:30 - 5:30 p.m., the peak traffic period for project-related traffic on non-game days, 9 of the 17 arterials street segments in the traffic study area are at LOS F, and 2 are at LOS E. These include the following arterials:

- Third Street between Berry Street and Market Street
- Fourth Street between Market and Harrison Streets
- Fifth Street between Brannan and Harrison Streets, both directions
- Sixth Street between Brannan and Howard Streets, both directions
- Harrison Street between The Embarcadero and Fourth Street (3 segments)

During the 6:30 - 7:30 p.m. time period, the hour before a weekday night game, both directions of Fourth Street between Market and Harrison are at LOS F, and all of the other 16 segments are at LOS D or better. (See Table IV.E.21, p. IV.136, in IV.E. Transportation and Circulation, for existing as well as future arterial levels of service.)

Intersection Analysis

To analyze existing intersection levels of service, turning movement volumes were collected at 66 study intersections on weekdays from 3:30 to 7:30 p.m. and at 41 intersections on weekday nights (10:30 to 11:30 p.m.) and on Saturdays.[15] Planning Department staff identified intersections which are already at or near capacity or are representative of area traffic volumes and congestion. Because current roadway construction temporarily affects traffic in the immediate vicinity of the project site, traffic counts conducted in July 1995 by Wilbur Smith Associates were used for the following intersections to provide a better representation of typical conditions: King/Third, King/Fourth, Berry/Third, and Berry/Fourth Streets.[16]

The intersection level of service information was used to determine average traffic conditions for one Saturday and four weekday time periods, reflecting the hours likely to be most affected by traffic arriving or leaving baseball games at the project site. The weekday afternoon study time period is 3:30 to 4:30 p.m. (coinciding with the likely time that day games would end at the ballpark).[17] Non-game day conditions consider 4:30 to 5:30 p.m., the current p.m. peak commute hour. Weekday night conditions were analyzed at 6:30 to 7:30 p.m. (coinciding with the time that most fans attending a night game would arrive at the project site) and 10:30 to 11:30 p.m. (coinciding with the time that night games are likely to end at the ballpark). The weekend day (Saturday) time period selected for this study is 4:00 to 5:00 p.m., coinciding with the time that weekend day games are likely to end.

Figures III.E.5 through III.E.9 present the existing levels of service for each intersection for each of the above time periods. During the 3:30 - 4:30 p.m. time period the most congested locations are near the Bay Bridge, with a total of eight locations at LOS F and four at LOS E. Conditions worsen during the 4:30 to 5:30 p.m. period with 19 intersections at LOS F and 4 at LOS E. By 6:30 - 7:30 p.m. conditions generally improve substantially, with two intersections at LOS E and three at LOS F. By 10:30 to 11:30 p.m. all intersections are at LOS A or B. Saturday conditions from 4:00 to 5:00 p.m. are also generally good with all intersections at LOS A or B. (Detailed information on intersection levels of service is provided in the Background Transportation Report, particularly Table 2-7.)

SOURCE: Wilbur Smith Associates

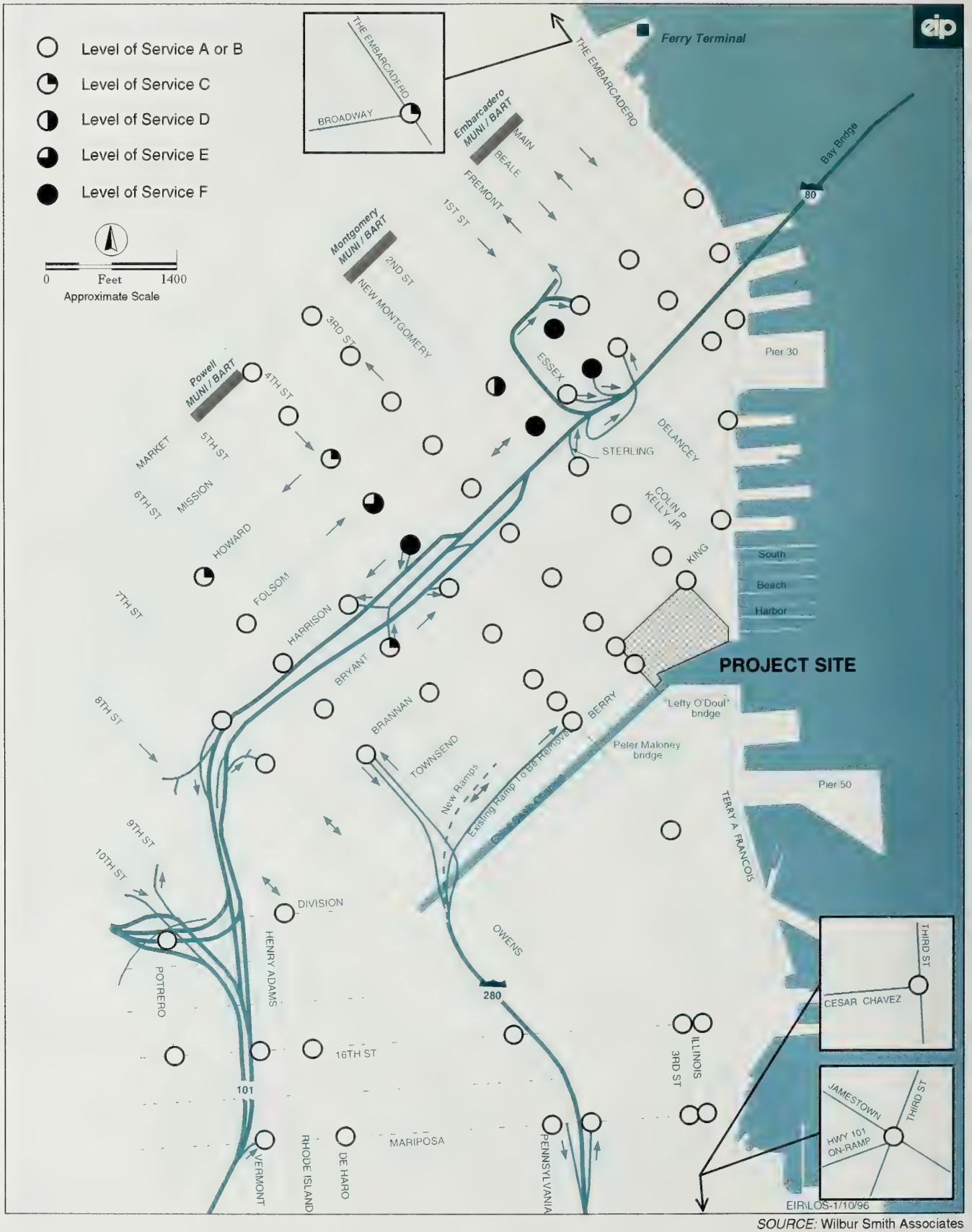
GIANTS BALLPARK

Figure III.E.5 Existing LOS 3:30 - 4:30 p.m.

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure III.E.6 Existing LOS 4:30 - 5:30 p.m.



SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure III.E.7 Existing LOS 6:30 - 7:30 p.m.

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure III.E.8 Existing LOS 10:30 - 11:30 p.m.

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure III.E.9 Existing LOS Saturday 4:00 - 5:00 p.m.

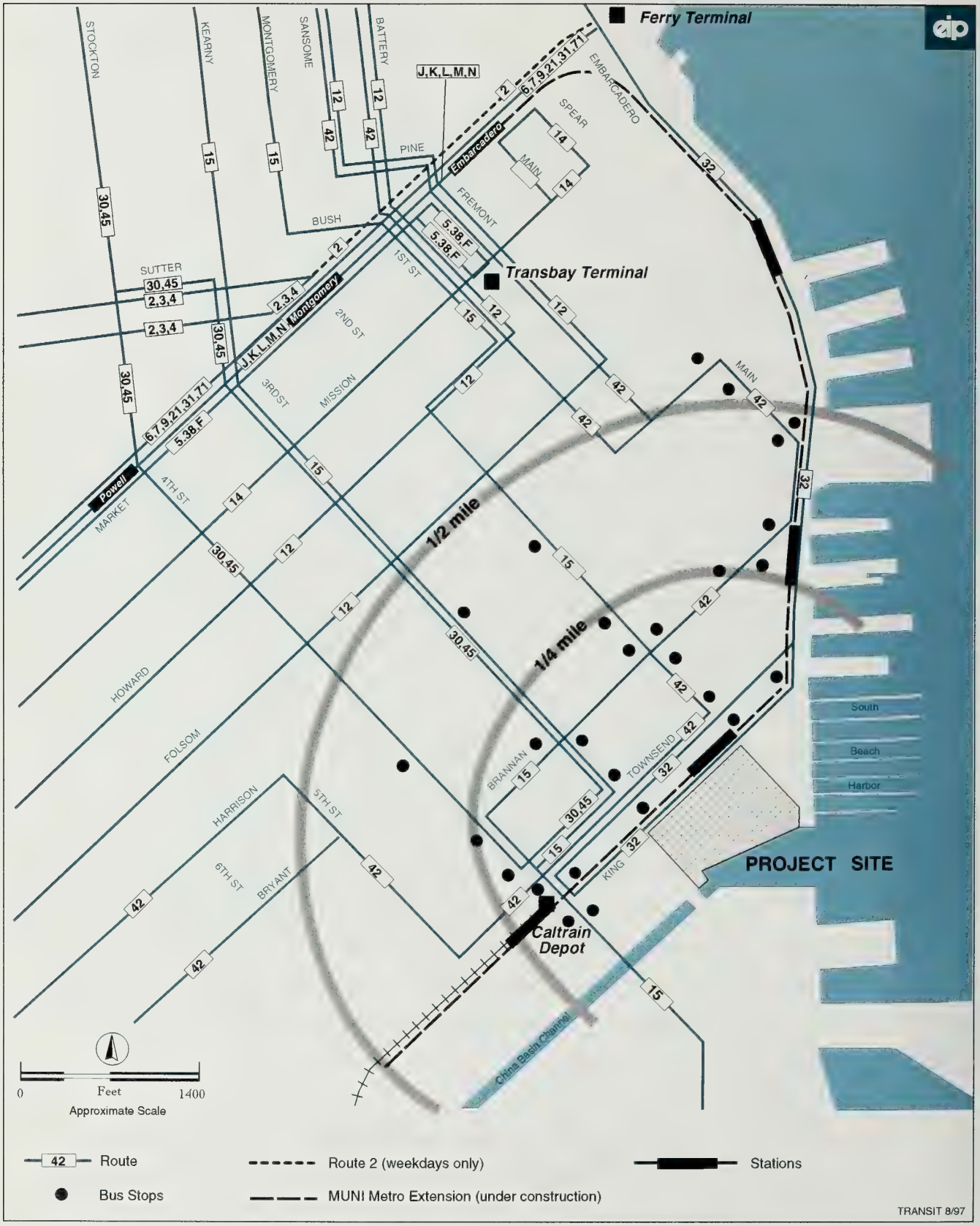
China Basin Channel Bascule Bridge Operations

The Lefty O'Doul Bridge at Third Street and Peter Maloney Bridge at Fourth Street over China Basin Channel are bascule (or lift) bridges operated by the San Francisco Department of Public Works. The bridges are raised to permit boats to pass from boat docks located west of the Fourth Street bridge out to the San Francisco Bay. Bridge tenders are on-duty 24 hours a day because under Federal Drawbridge Operating Regulation, 33 CFR 117.149 China Basin, Mission Creek, a bridge tender must open both bridges "on signal if at least one hour advance notice is given." The bridge tenders make every effort to respond to boaters' signals expeditiously, but delays of as much as one-half hour before the bridges can be lifted now occur when traffic on Third Street or Fourth Street is heavy. Such delays occur just prior to and just after games at 3Com Park on Candlestick Point. The frequency of bridge openings averages 40 to 75 per month during the winter, increasing in the spring and summer months. The highest observed number of openings was 180 in April 1994; the average number of openings per month in 1993 was 130.

Local Transit Facilities/Services

The San Francisco Municipal Railway (MUNI) operates local bus and rail transit service within the City. Figure III.E.10 shows the locations of existing MUNI service near the project site. The capacities and peak hour (4:30 to 5:30 p.m.) capacity utilization of the bus and rail lines serving the downtown area were analyzed based on design standards used by the MUNI Planning Division staff and data on the utilization at the maximum load point of each line (see Appendix C, Table X.C.3, p. A.103). Maximum load points represent locations on transit routes with the highest numbers of passengers on board.

The current availability of transit service capacity was analyzed in terms of a series of sub-regional screenlines. This analysis evaluates the combined hourly capacities and loads at the peak load points of all the transit routes crossing each screenline. The greatest utilization now occurs on the lines crossing the northeast screenline, which rings the northeast boundary



SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

● Figure III.E.10 Existing MUNI Transit

of the core of the San Francisco downtown area. Seventy-five percent of the available capacity crossing this screenline is now used during the p.m. peak hour. The southeast screenline, which is located at Sixteenth Street south of the project site, shows a 49 percent utilization factor.

Most of the routes that serve the project site converge at the Fourth and Townsend CalTrain Depot, which serves as a hub for these routes. Routes 32 and 42 pass closer to the project site, using Townsend Street to Second Street one block from the site. Third and Fourth Streets and Townsend Street are important transit streets for MUNI operations. The 15 bus, which uses the Peter Maloney bascule bridge, is the only regular transit service that crosses China Basin Channel.

MUNI Metro Extension (MMX) service along the southern portion of The Embarcadero will operate in the median of King Street and The Embarcadero. Service is scheduled to begin in the spring of 1998. A center platform station for the MMX Line measuring 15 ft. wide and 350 ft. long (four transit vehicle lengths) has been constructed on King Street just west of Second Street.

MUNI currently operates special ballpark express service to 3Com Park. The 9X Ballpark operates to Sutter and Montgomery (BART). The 28X Ballpark operates via Geneva Avenue, Nineteenth Avenue and Park Presidio to the Richmond District. The 47X Ballpark serves the Van Ness Avenue corridor. The Ballpark Shuttle operates between 3Com Park and Bacon Street and San Bruno Avenue in the Bayview District, providing connections to MUNI routes 9 and 15. In order to serve all these lines MUNI assigns about 18 buses for pre-game service and 19 for post-game service on weekdays for day games. For weekday night games MUNI assigns 14 pre-game and 19 post-game buses. About half of these weekday buses lay over at the stadium while the others are interlined back into service. On weekends, 19 buses are assigned pre-game and 27 post-game, only a few buses laying over. Collectively, MUNI's Ballpark Special bus services consistently serve about 3.5 percent[18] of baseball patrons; patronage rarely exceeds 4 percent or drops below 2 percent.

MUNI's ability to provide transit is directly related to the availability of vehicles. On weekdays, MUNI is sometimes unable with current operating resources to meet its scheduled service needs during peak commute periods. On school days additional buses are assigned on routes with substantial student ridership. MUNI's peak fleet deployment begins to build about 3:30 p.m. and relaxes after 6:00 p.m. On weekday nights after 10:00 p.m., only about 30 percent of MUNI's peak fleet capacity is deployed. On weekends MUNI deploys approximately 50 percent of its peak weekday fleet.

Parking Characteristics

This section presents an inventory of the existing parking spaces in the vicinity of the proposed ballpark site and the utilization (occupancy) of those spaces. The parking study area is defined as the area within a 15-minute walk radius of the Project site north of China Basin Channel. The study area is irregularly shaped, and bounded roughly by China Basin Channel to the south; The Embarcadero to the east; Sixth Street to the west; and Harrison, Folsom and Howard Streets to the north. For purposes of analysis, the study area north of the China Basin Channel is separated into 5-, 10- and 15-minute walk zones from the project site (see Figure III.E.3, p. III.64). The Giants have proposed to provide approximately 5,000 spaces south of China Basin Channel for dedicated ballpark parking; these would all be within a 15-minute walk from the site. There may also be some other on-street and off-street parking available south of China Basin Channel, but this is expected to be eliminated over time by the development of Mission Bay. For this reason, existing parking south of the Channel was not inventoried.

Parking Inventory

Several parking surveys have been performed that inventoried the parking supply and occupancy in the area north of and on the project site. These studies were reviewed and

confirmed through further field inventories in 1996 for this EIR (see Appendix C, Table X.C.5, pp. A.105 - A.106 for more detail regarding these inventories and results).

In the parking study area north of the Channel, there are approximately 13,095 spaces, 3,550 of which are on-street, and 9,540 of which are off-street (see Table III.E.1). An additional approximately 300 spaces are presently available on the project site and are included in the inventory. Off-street parking includes approximately 6,485 spaces which are available to the general public, and 3,055 private spaces which are restricted to customers and employees of private businesses, companies or public agencies. Within a 5-minute walk of the ballpark site, there are approximately 1,475 total parking spaces; within 10 minutes, 5,050 total spaces; and within 15 minutes, 13,095 total spaces.

Existing Parking Occupancy

Existing parking utilization (occupied spaces) was examined for weekday midday and evening periods, and a Saturday midday period. The survey periods represent times when there would be maximum parking demand by ballpark fans. For a weekday afternoon game, the parking surveys were done at 1:30 - 3:30 p.m.; for a weekday evening game, 6:30 - 8:30 p.m. The weekend day survey was conducted from noon to 1:00 p.m. on a Saturday. Surveys were conducted during hours that are later than the Giants proposed start times in order to reflect likely maximum parking conditions when there would be peak midday occupancy by downtown area workers and visitors, leaving a relatively small number of spaces available for Giants fans, and during peak evening occupancy when residents of the South Beach neighborhood have already returned home and parked for the evening or weekend, also leaving the smallest number of available spaces for Giants fans in the impacts analysis.

TABLE III.E.1
PARKING INVENTORY

Walking Distance From the Ballpark	On-Street Parking: On-Street	On-Street Parking: Cumulative Total	Off-Street Parking: Off-Street Public	Off-Street Parking: Off-Street Private	Off-Street Parking: Cumulative Total	Cumulative Parking Totals
0 to 5 minutes	503	503	490	482	972	1,475
5 to 10 minutes	1,336	1,839	1,413	824	3,209	5,048
10 to 15 minutes	1,713	3,552	4,582	1,750	9,541	13,093
Total	**3,552**	---	**6,485**	**3,056**	---	---

Notes:
Walking Times - Assume a speed of 3.7 feet per second (220 feet per minute or 2.5 miles per hour) which is typical for an average adult's moderate pace.

On-Street - Publicly available, on-street spaces, either metered or with time limits/restrictions posted.

Public Off-Street - Publicly available, off-street parking in lots or garages, either marked or unmarked, and either self-park or valet.

Private Off-Street - Off-street parking designated for customer or employee use; either marked or unmarked, and either self-park or valet.

Sources: Pittman & Hames Associates, July 1996; Korve, Engineering, Rincon Entertainment Center Parking Survey, 1996; Robert L. Harrison, Transportation Consultant, China Basin Ballpark Parking Survey, November, 1994; and Department of City Planning Parking Survey, 1992.

In all cases, the choice of times establishes a "worst reasonable case" analysis of parking space availability and impacts.

Parking Utilization/Availability: Weekday Afternoon

This period represents peak parking demand conditions when ballpark patrons would compete with downtown workers and business customers for available parking. The Giants have indicated that weekday afternoon games would be limited to approximately 13 per season. Overall, there are about 2,570 spaces available during the midday, of which 220 are on-street parking, 1,105 are off-street public parking, and 1,245 are private, off-street parking. On-street parking during this period is essentially fully occupied within the five-

and ten-minute walk zones, and about 90 percent occupied in the 15-minute walk zone. Off-street public parking is over 80 percent occupied for all walk time zones during midday conditions. Off-street private parking available to customers and employees is over 65 percent occupied within the zero- to five-minute walk time zone, about 70 percent occupied in the 5- to 10-minute walk zone, and about 52 percent occupied in the 15-minute walk zone.

Parking Utilization/Availability: Weekday Evening

In comparison to midday, parking utilization during the weekday evenings is much lower. By evening, parking used by area employees, downtown workers, and overflow parkers from the Financial District is much lower, and is replaced by residential parking and retail commercial parking from uses such as restaurants and bars. There are a total of 8,430 spaces available during the weekday evenings, of which 1,600 are on-street, 4,815 are off-street public and 2,015 are off-street private. On average, on-street parking is about 60 percent occupied in the 0- to 5- and 5- to 10-minute zones and 45 percent in the 10- to 15-minute zone. Off-street parking is about 35 percent occupied in the 0-5 minute walk zone, but is about 45 percent utilized in the 5- to 10-minute walk zone, and about 30 percent occupied in the 10- to 15-minute walk zone. On-street parking is about 60 percent occupied in the 0-5 and 5-10 minute walk zones, most likely due to restaurant and retail patrons. Occupancy drops to about 45 percent in the 10- to 15-minute walk zone.

Parking Utilization/Availability: Saturday Midday

Utilization of on-street parking during Saturday midday is similar to midday weekdays, except for the 10- to 15-minute walk zone. This is probably due to less restrictive parking regulations farther south of Market Street, and people taking advantage of "free" parking near the downtown area and The Embarcadero. There is a noticeable decrease in the use of

public parking lots on Saturdays, as many of these lots are closed or people are willing to walk greater distances to avoid paying for off-street parking. Approximately 6,565 spaces are available, including about 720 on-street, 4,600 public off-street, and 1,245 private off-street spaces. While detailed inventories were not taken by the EIR consultants, observations made by Giants' consultants show that on Sundays there is considerably more parking available in the study area (up to 1,400 additional spaces)[19] than on Saturdays. Therefore, the Saturday parking analysis provides the more conservative picture.

- *South Beach Harbor Marina*

There are two waterfront-related uses which depend upon existing off-street parking in the study area, north of China Basin Channel. The South Beach Marina is a 680-berth facility located south of Pier 40, which is within a 5-minute walk distance to the ballpark site. Currently marina tenants and their guests park at Pier 40 and other nearby off-street facilities. As discussed on p. III.29, the San Francisco Redevelopment Agency is considering development of 210-250 parking spaces, possibly under an earthen berm, to accommodate visitors to the harbor. This parking facility would share a common entrance to the ballpark parking under the left field and center field bleachers.

- *South of Channel Parking*

A number of maritime recreational facilities, businesses and industries are located south of China Basin Channel, including a public boat launching facility at Pier 52, east of Terry A. Francois Boulevard. Parking along Terry A. Francois Boulevard is mostly informal, and is located on the broad paved areas that form part of the roadway. Therefore, it is difficult to determine the exact number of parking spaces available. Some of the parking along Terry A. Francois Boulevard is within a 15 to 20 minute walk distance of the ballpark site.

South Beach Residential Parking

In October 1996, a survey was distributed to five South Beach residential developments. The purpose of the survey was to identify the ballpark's potential effects on existing residential parking conditions in the South Beach area. The five developments, containing a total of 1,734 housing units, are all located within the parking study area. In consultation with the Planning Department, a one-page survey was developed. The one-page survey consisted of six questions which addressed car ownership, housing tenure, where tenants parked, how much they paid for parking (either on-site or off-site), and what times they needed to use off-site parking for their personal use or for their guests. (See Appendix E of the Background Transportation Report for a description of the survey methodology and results, and a copy of the survey form.)

The responses provide an overview of existing parking conditions as reported by the limited number of South Beach residents who responded (an overall response rate of 17 percent was obtained). About 70 percent of the respondents typically park one or more cars at their residential building; 30 percent park one or more cars on-street, with most able to park within two blocks of their housing development. Demand for parking outside of the residential building garages generally peaks between 6:00 p.m. and 9:00 p.m. on weekdays.

Potrero Hill Area Parking

The Potrero Hill residential area is located outside of the parking study area, within a 25 to 30 minute walk distance from the ballpark site. The Potrero Hill residential area is generally concentrated south of Mariposa Street, between U.S. 101 and I-280. This neighborhood has unrestricted residential parking.

PEDESTRIAN AND BICYCLE ACCESS

Pedestrian activity in the immediate vicinity of the project site is light during all study time periods. However, the number of pedestrians is high in some areas adjacent to the project site including 1) along portions of The Embarcadero from the South Beach Park north to the Ferry Building during weekday mid-day periods and on weekends and 2) near the CalTrain Depot during weekday morning and afternoon commute periods. Pedestrian volumes were compared with available capacity, crosswalk or sidewalk width, at the crosswalks in 16 intersections and at 26 sidewalk locations near the ballpark site (see Appendix C, Figure X.C.2, p. A.118, and Table X.C.6, pp. A.107 - A.117). Pedestrian levels of service are ranked from LOS A (best) to LOS F (most congested), in a manner similar to traffic service levels (see Appendix C, Table X.C.7 for detailed definitions of pedestrian service levels). Existing pedestrian levels of service at the study locations were all LOS A.

Farther from the project site, existing pedestrian corridors include Third and Fourth Streets between Folsom and Market Streets which are part of the designated "citywide pedestrian network." Designated "neighborhood pedestrian streets" that are within the project study area include Second, Third, and Fourth Streets; and Bryant and Harrison Streets west of Fourth Street. King Street will be added to the designated network once construction of the roadway and transit line is completed. According to the *San Francisco General Plan Transportation Element*, the designated "citywide pedestrian network" identifies a linkage of pedestrian walkways and stairways through and between neighborhoods used by commuters, tourists, recreational users and the general public. The designated "neighborhood pedestrian network" provides similar pedestrian facilities within neighborhoods.

Existing Pedestrian System Characteristics

The capacity of a sidewalk or crosswalk is based upon its width after adjustments have been made to account for obstacles or other objects which block a portion of the pedestrian's path. A typical block in the study area, for example most of those along Third Street and portions of Second Street, has numerous objects placed on the sidewalk. These objects, which act as obstructions to pedestrian flow, reduce the effective width of the sidewalk. Along the Third Street blocks, for example, the 18 to 24 inches along the curb are unusable due to the presence of trees, parking meters, street light poles, etc. When buildings directly abut the sidewalks, as they do in the study area, 12 to 18 inches is subtracted due to "shy" distance from the building to account for steps, footings, and the fact that people do not walk with their shoulders brushing the building walls.

On Second Street between King and Townsend Streets, the east-side sidewalk is improved for only the first 20 ft. or so north of King Street. It then narrows to only five ft. wide. The narrowest point occurs when there is a No Parking sign on the left and a utility pole on the right, yielding an effective width of only 3.5 ft. On the west side, there is no actual sidewalk, and virtually the whole frontage is a de facto loading zone with cars and trucks parked at a 90-degree angle to the street.

North of Townsend Street on Second Street and Third Street, the sidewalks are 9 to 10 ft. wide, but street furniture and other necessary appurtenances occupy some of this space. For example, the east-side of Second Street between Townsend and Brannan Streets has 18 objects: 5 trees, 3 utility poles, 3 fire hydrants, 2 garbage cans, 2 No Parking signs, 2 signal poles, 1 signal controller, and 1 mail box. Depending on the location of the items on the left and right side of the sidewalk, the effective width ranges from 3 to 7 ft.

Third Street sidewalks are more cluttered because of parking meters, trolley line support poles, newspaper racks and business advertising placards. On Third Street between King and Townsend Streets, the effective width at one point is only 3.5 ft. due to such

obstructions. The east-side sidewalk between Townsend and Brannan Streets has 48 obstructions, including 12 parking meters, 5 trees, 6 planters and 2 or 3 of each of the following: signal poles, fire hydrants, garbage cans, and newspaper racks. The most substantial bottleneck is caused by the MUNI bus shelter south of Brannan Street; only 4.5 ft. of clear space remains between the bus shelter and the curb, reducing the effective width to 2.5 ft. The sidewalk to the north of the shelter up to Brannan Street is also cluttered with newspaper racks, large concrete planters, garbage cans, and a fire hydrant.

Bicycle Access System Characteristics

The level of bicycle activity varies widely within the project study area, as do the types of facilities available. There is a growing number of commuter and recreational bicyclists riding along the waterfront due to the increased density of retail and residential uses. Bicyclists share the roadways as well as Herb Caen Way along The Embarcadero. On-street bike lanes are currently provided on The Embarcadero between Folsom Street and Townsend Street and on Sixteenth Street from Third Street to Henry Adams Street. The draft San Francisco Bicycle Plan proposes bike lanes on Townsend Street (between Third and Division Streets), Second Street, and Fifth Street and wide curb lanes on Potrero Avenue. Mariposa Street is proposed in the draft plan to be designated as a Class III "bicycle route" (signs but no bike lanes).

FREIGHT LOADING AND SERVICE

This section focuses on the movement of goods, rather than people. Goods movement affects economic development both in terms of intra-urban as well as interstate travel. This section describes truck routes and unloading/pickup activities and facilities in the immediate vicinity of the project site, in the area bounded by Brannan Street, Fourth Street, Berry Street and the San Francisco Bay.

Roadways in the study area that carry substantial truck traffic include all freeways, The Embarcadero, Townsend Street and Third Street. The movement of trucks is directed by specific signs to and from the Bay Bridge, I-280 and U.S. 101. Signed freeway access routes include Third, Townsend, Bryant, Harrison, Folsom and Fremont Streets. Third Street has through truck restrictions south of Jerrold Avenue in the South Bayshore neighborhood, requiring most through trucks to use Cesar Chavez (Army) Street for freeway access. In addition, Mariposa, Sixteenth and Illinois Streets provide access to the waterfront and experience substantial truck traffic. Local cross streets north and west of China Basin such as Berry, Third, and Bryant Streets must be used to access I-80. South of China Basin, including the container shipping terminals at Piers 80 - 96, trucks typically use Cesar Chavez Street from U.S. 101 and I-280. Other than Second Street near I-80, the local street system does not present any substantial congestion problems for goods and service movements; however, congestion on I-80 and U.S. 101 provides constraints, particularly for truck movements to and from the East Bay.

An inventory was conducted of the roadway frontages with yellow loading zones, roll-up doors, loading bays, or observed substantial on-street parking/loading by trucks during weekday afternoon study hours. These include the east side of The Embarcadero roadway between Townsend and Brannan Streets which serves Piers 34 - 40 on the San Francisco waterfront.

Brannan and Townsend Streets also serve truck unloading/pickup activities during weekday afternoon study hours. The north side of King Street between Second and Third Streets serves numerous truck bays, and commercial businesses along both sides of Third and Fourth Streets between King and Bryant Streets require periodic truck unloading activities. Alleys connecting King with Townsend and Brannan Streets provide some off-street truck unloading/pickup facilities. South of the project site in an area planned for project parking, Illinois Street may serve as an access route to and from the project parking lot. Illinois Street serves existing warehouses and there are considerable numbers of trucks parked on both sides of Illinois Street from Mission Rock Street (near the intersection of Third and Fourth Streets) to south of Mariposa Street.

In the area to the northeast of the project site there are an estimated 110 commercial loading facilities. The majority (55 percent) of the facilities are roll-up doors at which trucks park parallel to the curb when loading and unloading. Many, but not all, of the roll-up door facilities are fronted by restricted use yellow curb zones. Loading bays which allow a large truck to load off-street make up about 35 percent (38 facilities) of the supply. The remaining 10 percent (12 docks) of area loading facilities require the delivery truck to block the sidewalk and in some cases partially block a travel lane. Located on the north face of King Street (across from the project site) are a total of four loading dock facilities at which trucks block sidewalks.

Freight rail tracks are located in Terry A. Francois Boulevard serving Pier 50 and adjacent to Piers 54 and 64. This rail line has not been used for over one year.

TRANSPORTATION ELEMENT OF SAN FRANCISCO'S GENERAL PLAN

As discussed in III.A. Consistency with Existing Plans and Policies, p. III.3, the *San Francisco General Plan,* adopted by the Planning Commission, is the comprehensive, long-term general plan that contains land use and development policies for San Francisco. The General Plan includes a *Transportation Element*, which was recently revised in July 1995. A number of the Objectives and Policies listed in the *Transportation Element* are relevant to the proposed project. These applicable policies are listed and discussed below.

The proposed new location for the ballpark would make it both more feasible and more attractive for fans and employees to use transit to travel to/from the site compared to the existing location at 3Com Park. Relevant objectives and policies include:

> Objective 1: "To meet the needs of all residents and visitors for safe, convenient and inexpensive travel within San Francisco and between the City and other parts of the region while maintaining the high quality living environment of the Bay Area."

Policy 1.3: "Give priority to public transit and other alternatives to the private automobile as the means of meeting San Francisco's transportation needs, particularly those of commuters."

Objective 11: "Maintain public transit as the primary mode of transportation in San Francisco and as a means through which to guide future development and improve regional mobility and air quality."

Policy 11.3: "Encourage development that efficiently coordinates land use with transit service, requiring that developers address transit concerns as well as mitigate traffic problems."

Objective 13: "Promote the development of marketing strategies that encourage and facilitate the use of transit and other alternatives to the single-occupant automobile for shopping, recreation, cultural and other non-work trips."

Policy 13.1: "Encourage the use of alternatives to the automobile for all age groups in the advertisement of businesses, recreational and cultural attractions by identifying their proximity to transit facilities and significant landmarks."

Policy 13.2: "Promote the identification of core fixed guideway and regional transit lines, such as BART, Muni Metro, cable car, CalTrain and ferry lines, on maps and literature designed for tourists and visitors."

Objective 14: "Develop and implement a plan for operational changes and land use policies that will maintain mobility and safety despite a rise in travel demand that could otherwise result in system capacity deficiencies."

Policy 14.7: "Encourage the use of transit and other alternative modes of travel to the private automobile through the positioning of building entrances that prioritize access from these modes."

Objective 18: "Establish a street hierarchy system in which the function and design of each street are consistent with the character and use of adjacent land."

Policy 18.5: "Mitigate and reduce the impacts of automobile traffic in and around parks and along shoreline recreation areas."

The project site was selected by the Giants in part to take advantage of transit and alternatives to the automobile when traveling to the ballpark. The Giants are considering development of a ferry service program, which would allow the site to be accessed by water from North and East Bay locations where ferry service is available; this ferry service variant is described and analyzed in Chapter VII. Several policies encourage use of water-based transportation:

> Objective 4: "Maintain and enhance San Francisco's position as the hub of a regional, city-centered transit system."
>
> > Policy 4.8: "Expand and coordinate the use of ferries, water taxis and other forms of water-based transportation with each other and with landside transportation in waterfront communities in San Francisco and across the bay, using San Francisco's Ferry Building as the main transfer point."
>
> Objective 21: "Develop transit as the primary mode of travel to and from downtown and all major activity centers within the region."
>
> > Policy 21.5: "Facilitate and continue ferries and other forms of water-based transportation as an alternative mode of transit between San Francisco and other communities along the Bay, and between points along the waterfront within San Francisco."
> >
> > Policy 21.6: "Establish frequent and convenient transit service, including water-based transit, to major recreational facilities and to provide special service for sports, cultural and other heavily attended events."

Loading docks are proposed to be off-street, accessed from a driveway at King Street near Second Street. Off-street loading reduces conflicts caused by double parking. Some loading proposed for the Pavilion Building would be located on the ground level, behind the retail area and adjacent to parking, both accessed from Third Street. This area would not accommodate large tractor-trailer assemblies. The relevant policy in the *Transportation Element* is Policy 20.2, under Objective 20:

Objective 20: "Give first priority to improving transit service throughout the City, providing a convenient and efficient system as a preferable alternative to automobile use."

Policy 20.2: "Reduce, relocate or prohibit automobile facility features on transit preferential streets, such as driveways and loading docks, to avoid traffic conflicts and automobile congestion."

Since the proposed project would bring about an increase in pedestrian traffic, the existing walkway at Pier 46B is proposed to be improved as a Port Walk to provide public access to the Bay, and access to the ballpark from the waterfront. The Port Walk would be approximately 20 ft. wide, allowing for the passage of a high volume of pedestrian traffic. Additionally, the sidewalk along the south side of King Street between Second and Third Streets would be widened to approximately 20 ft. Relevant policies include:

Objective 23: "Improve the City's pedestrian circulation system to provide for efficient, pleasant, and safe movement."

Policy 23.2: "Widen sidewalks where intensive commercial, recreational, or institutional activity is present and where residential densities are high."

Policy 23.5: "Minimize obstructions to through pedestrian movement on sidewalks by maintaining an unobstructed width that allows for passage of people, strollers and wheelchairs."

As part of the proposed project, the Giants have committed to provide a designated fenced bicycle parking area for about 250 bicycles in the proposed parking lot immediately south of China Basin Channel.

Objective 28: "Provide secure and convenient parking facilities for bicycles."

Policy 28.1: "Provide secure bicycle parking in new governmental, commercial, and residential developments."

Surface parking is planned south of China Basin Channel on properties owned by the Port and Catellus Development Corporation. The 5,000 parking spaces would be used for an interim period. Construction of these parking spaces would not involve demolishing residential, commercial or industrial buildings, and would not be near existing residential neighborhoods.

Objective 30: Related to Citywide parking, this objective states: "Ensure that the provision of new or enlarged parking facilities does not adversely affect the livability and desirability of the City and its various neighborhoods."

Policy 30.2: "Discourage the proliferation of surface parking as an interim land use, particularly where sound residential, commercial or industrial buildings would be demolished pending other development."

Policy 30.3: "Maximize the efficient use of land devoted to parking by consolidating adjacent surface lots and garages into a parking structure, possibly containing residential, commercial or other uses."

Objective 33: "Contain and lessen the traffic and parking impact of institutions on surrounding residential areas."

Policy 33.2: "Protect residential neighborhoods from the parking impacts of nearby traffic generators."

The project proposes one main loading area off King Street. It would contain seven loading docks to be used for concession delivery, broadcast trucks, merchandise delivery and waste removal. This number of loading docks would meet City Planning Code requirements. Parking on the ballpark site would be accessed from two driveways: the main parking area would use the same access as the loading docks, from King Street via a driveway located near Second Street. The second, smaller lot would be on the ground level of the Pavilion Building, behind the retail area, accessed from Third Street. The following objectives and policies are relevant:

Objective 40: "Enforce a parking and loading strategy for freight distribution to reduce congestion affecting other vehicular traffic and adverse impacts on pedestrian circulation."

Policy 40.1: "Provide off-street facilities for freight loading and service vehicles on the site of new buildings sufficient to meet the demands generated by the intended uses. Seek opportunities to create new off-street loading facilities for existing buildings."

Policy 40.4: "Driveways and curb cuts should be designed to avoid maneuvering on sidewalks or in street traffic, but when crossing sidewalks they should be only as wide as necessary to accomplish this function."

NOTES - Transportation and Circulation

1. California Department of Transportation, Traffic survey files, 1996.

2. California Department of Transportation, Traffic survey files, 1996 and San Francisco County Transportation Authority, Congestion Management Plan network annual monitoring reports, 1995.

3. California Department of Transportation, Traffic survey files, 1996 and San Francisco County Transportation Authority, Congestion Management Plan network annual monitoring reports, 1995.

4. California Department of Transportation, Traffic survey files, 1996 and San Francisco County Transportation Authority, Congestion Management Plan network annual monitoring reports, 1995.

5. California Department of Transportation, Traffic survey files, 1996.

6. California Department of Transportation, Traffic survey files, 1996.

7. California Department of Transportation, Traffic survey files, 1996.

8. California Department of Transportation, Traffic survey files, 1996.

9. California Department of Transportation, Traffic survey files, 1996.

10. These three Golden Gate Transit routes are described in detail in the *Transportation Background Report for the San Francisco Giants Ballpark at China Basin*, March 1997.

11. Maurice Palumbo, Transit Planner, Golden Gate Bridge Highway and Transit District, telephone conversation, January 24, 1997.

12. A "major arterial" is a "cross-town thoroughfare whose primary function is to link districts within the city and to distribute traffic from and to the freeways; these are routes generally of citywide significance; of varying capacity depending on the travel demand..." City and County of San Francisco, Department of City Planning, *General Plan, Transportation Element*, Table 1: Classification of Elements in Vehicular Circulation Plan, p. I.4.35.

13. The Metropolitan Transportation System is a regional network of freeways, major and secondary arterials, transit and recreational streets meeting criteria developed by the Metropolitan Transportation Commission as part of the Regional Transportation Plan. Due to the MTC criteria, the streets in the MTS are not identical to those included in the Congestion Management Plan. City and County of San Francisco, Department of City Planning, *General Plan, Transportation Element*, Table 1: Classification of Elements in Vehicular Circulation Plan, p.I.4.35.

14. *The Alternatives to the Embarcadero Freeway and the Terminal Separator Structure FEIS/EIR* (94.060E, certified September 1996), assumes Harrison Street to be one-way between First Street and Third Street in the future. However, at this time the Department of Parking and Traffic has no plans to designate this portion of Harrison Street as one way.

15. Fewer intersections were analyzed for weekday late night (10:30 - 11:30 p.m.), and for weekend afternoons because all intersections operate at LOS B or better, so only intersections near the project site or at freeway ramps were chosen for study.

16. 1996 counts conducted at Berry/Fourth Streets after 6:30 p.m. when construction detours not in effect.

17. Information on game times and typical length of games based on memorandum, Jack Bair, Vice President and General Counsel, San Francisco Giants, May 23, 1996.

18. Bob Fossa, Scheduling Statistician, MUNI, telephone conversation, May 23, 1996.

19. Robert L. Harrison, Transportation Planning, China Basin Ballpark Parking Survey, March 1995.

F. NOISE

INTRODUCTION

Sound levels are measured in decibels (dB).[1] Because the human ear is not equally sensitive to all frequencies of sound, a frequency-dependent weighting scheme is imposed whenever sound is measured; these measurements are reported in A-weighted decibels—dBA. Each 3 dB increase or decrease in sound level represents a doubling or halving, respectively, of sound energy. In general, a difference of 3 dB is noticeable to most people and a difference of 10 dB is perceived as a doubling of loudness. Appendix D provides additional information on noise measurements and human reactions to environmental noise.

Noise levels typically fluctuate over time. Several indicators have been developed to describe environmental noise. Two of the most commonly used indicators are L_{eq} and L_{dn}.[2, 3] L_{eq} is an average of noise over a stated time period; L_{dn} is a 24-hour average, calculated just like L_{eq} but accounting for the greater sensitivity of most people to nighttime noise. CNEL is also a 24-hour average, like L_{dn}, but is further weighted for sensitivity to evening noise.[4] These and other indicators are used to describe noise from different sources in different locations. For example, L_{dn} or CNEL are often used to describe general community noise levels, as they provide average noise levels over the entire 24-hour day; in the analysis for the proposed ballpark, L_{dn} is used to discuss traffic noise during the 24-hour day at residential uses. The L_{eq} over a one-hour period is used to describe the crowd noise from a baseball game, as it would not last the entire day, and to describe the traffic noise near non-residential sensitive receptors like churches and schools because most people would not stay in those locations for more than a few hours.

Noise levels from a particular source decline as distance to the listener increases. A commonly used rule of thumb is that for every doubling of distance from the source, the noise level is reduced by about 3 dB. Noise levels are also reduced by intervening structures— generally,

about 5 dB for a substantial intervening building. (Computer models used for the analysis in this EIR to estimate future noise levels use more sophisticated formulae for establishing reductions in noise levels between the source and the site being analyzed.)

REGULATIONS AND POLICIES

Following is a discussion of the San Francisco noise ordinance and adopted policies related to community noise.[5]

San Francisco Noise Ordinance

The San Francisco Noise Ordinance is found in Article 29 of the San Francisco Police Code. It regulates both construction noise and fixed-source noise. Sections 2907 and 2908 regulate construction noise, and provide that:

- Construction noise is limited to 80 dBA at 100 feet (ft.) from the equipment during daytime hours (7 a.m. to 8 p.m.). Impact tools are exempt provided that they are equipped with intake and exhaust mufflers.
- Nighttime construction (8 p.m. to 7 a.m.) that would increase ambient noise levels by 5 dBA or more is prohibited unless a permit is granted by the Director of Public Works.

Section 2909 regulates fixed-source noise such as mechanical noise from buildings, measured at the property line of the *affected* property, establishing maximum noise limits. The noise limits are established for zoning districts in which the affected property is located. In residential areas, generally noise levels are limited to 55 to 60 dBA during the day and 50 to 55 dBA during the night. In commercial areas acceptable noise levels are 60 dBA at night

and 70 dBA during the day. In industrial areas, 70 dBA is the established acceptable noise level any time.

A general provision in the ordinance permits the City to regulate unnecessary, excessive or offensive noise that is annoying to most people. Summarized below from Sections 2915 and 2901.11, this provision generally prohibits excessive noise:

- Unnecessary, excessive or offensive noise which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance of any reasonable person of normal sensitivity residing or working in the area is prohibited. A noise level which exceeds the ambient noise level by 5 dBA or more, as measured at an affected receptor's property line, is deemed a prima facie violation of the Ordinance.

San Francisco General Plan

The San Francisco *General Plan Environmental Protection Element* includes a section on Transportation Noise, as cars, trucks and buses are the major source of noise in San Francisco's dense urban setting. It contains Objectives to reduce transportation noise and to promote land uses that are compatible with the existing noise environment. The *Element* includes a Land Use Compatibility Chart that suggests "satisfactory" exterior noise levels for various land uses. The maximum exterior L_{dn} considered "satisfactory, with no special noise insulation requirements" for residential and transient lodging land uses is 60 dBA, for schools and churches is 65 dBA, and for office buildings is 70 dBA.[6] In areas where the 24-hour average noise levels exceed these values, the *Environmental Protection Element* suggests that a detailed analysis of noise reduction requirements be made and that noise insulation features be included in the design of new development. New residential uses are discouraged in the *Element* in areas with exterior L_{dn} values above 65 dBA unless noise insulation is included.

NOISE-SENSITIVE USES

Certain types of land uses are considered more sensitive than others to higher noise levels. Schools, churches, libraries, hospitals and nursing homes are generally more sensitive to noise than are commercial, office and industrial uses. Residential land uses are also generally considered noise-sensitive uses because noise can disrupt sleep, conversation, reading, and similar activities that can occur at any time. Noise has been found to be especially disruptive in the evening and at night.

Sensitive Uses in Project Area

The China Basin area and nearby South Beach are comprised of a mix of industrial, commercial and residential uses. The closest residential areas are on Townsend Street, including the San Francisco RV Park between Third and Fourth Streets, the South Beach Marina Apartments between Colin P. Kelly, Jr. Street and The Embarcadero, and the Steamboat Point Apartments bordered by The Embarcadero and Townsend Street. A residential building is expected to be under construction by summer, 1997, on the site across King Street from the ballpark site, east of Second Street. Residential uses and other sensitive uses are also located on streets near the project site that would be used by ballpark traffic, such as the residences on South Park Drive near Third Street, the Hotel Utah on Fourth Street at Bryant Street, and the children's day care center on Harrison Street near Spear Street. In addition, a residential area on Potrero Hill begins approximately one mile southwest of the ballpark site; many of these residences would have an unobstructed view of the proposed ballpark and therefore may receive sound from the ballpark.[7]

EXISTING NOISE ENVIRONMENT

Measurements of existing ambient noise levels were made along representative major streets and at sensitive receptor locations to establish a baseline for analyzing noise from increased traffic due to the proposed ballpark and for analyzing noise from crowds and events at the ballpark.

Existing Traffic Noise Levels

To provide a baseline for analyzing traffic noise, short-term (15-minute) measurements were made at 13 locations along major streets within the project traffic study area, which extends south from Market Street to Mariposa Street and Potrero Hill, and west from San Francisco Bay to about Eighth Street. Specific measurement locations were selected to represent the exterior noise at noise-sensitive land uses along street segments where project traffic noise effects could be anticipated, based on the results of the traffic impacts analysis. The locations are shown on Figure III.F.1; the numbers on the map correspond to the site numbers on Table III.F.1, p. III.117, which provides the results of the measurements. Measurements were made in the afternoon and early evening, simultaneously with traffic counts, in order to calibrate the computer model's relationship between noise levels and traffic volumes. Noise measurements were made for 15 minutes at each location; this was assumed to represent the hourly L_{eq} noise levels for each location at the time of measurement. The 24-hour L_{dn} was calculated, based on these measurements and 24-hour traffic data, for residential locations. L_{dn} is used for traffic noise near residential land uses because changes in traffic noise could affect residents at all times and residences are especially sensitive at night (when L_{dn} adds a 10 dBA penalty).[8] A one-hour L_{eq} was used to describe traffic noise for non-residential sensitive land uses because these uses are occupied for certain portions of a 24-hour day.

SOURCE: EIP Associates

GIANTS BALLPARK

Figure III.F.1 Ambient Noise Measurement Locations

TABLE III.F.1
MEASURED AMBIENT NOISE LEVELS ALONG MAJOR ACCESS ROADS IN THE PROJECT SITE VICINITY

Location[3]	Nearest Noise-Sensitive Receptor	Period[1]		Nearest Major Traffic Noise Sources			Comments	Sound Level Statistics (dBA)[2]		
		Date	Start Time	Name	Segment	Distance to Centerline		1-hour Leq	Lmax	Ldn[4]
1	Marin Day School (Day Care)	9/25/96	17:34	Harrison St.	E:Spear St.	35'		71	82	NA
2	Bay Crest Apartments	10/8/96	14:10	Harrison St.	W:Main St.	30'		73	85	72
3	Nr residence, 29 Guy Place	9/25/96	16:36	First St.	@ Guy Pl.	175'	Substantial reflection of noise by building facades bordering alley	64	78	67
4	Mendelsohn House (senior housing)	10/1/96	16:26	Folsom St.	E:Fourth St.	40'		70	81	71
5	Filipino Educational Center	10/8/96	14:45	Harrison St.	W:Fourth St.	45'		71	87	NA
6	Delancey Street Apartments	9/25/96	18:20	Brannan St.	E:Delancey St.	40'		67	78	70
7	Steamboat Point Apartments	10/1/96	17:50	The Embarcadero	S:Townsend St.	80'		69	84	68
8	San Francisco RV Park	10/1/96	17:13	Townsend St.	W:Lusk St.	40'		71	82	72
9	South Park, nr residence, 171 South Park Dr.	9/25/96	19:08	Third St.	@ South Park Dr.	200'		63	71	66
10	An upper-story residence, 550 Third St.	10/8/96	15:42	Third St.	N:South Park Dr.	42'		72	84	73
11	Hotel Utah	10/8/96	16:29	Fourth St.	@ Bryant St.	40'		73	89	79
12	Nr residence, 480 Sixth St.	10/1/96	18:48	Sixth St.	N:Bryant St.	40'		73	86	75
13	St. Gregory's Episcopal Church	10/1/96	19:30	Mariposa St.	N:De Haro St.	35'	Steep roadway grades probably increase noise emissions from autos here	61	79	NA

Notes:
1. The duration for each of the measurements was 15 minutes.
2. Noise measurements were performed using a Larson-Davis 720 sound level meter, calibrated with a Larson-Davis CA-250 calibrator.
3. See Figure III.F.1 for a map of locations.
4. These values are the L_{dn}'s at the nearest noise sensitive receptor. They were estimated by using the SOUND32 traffic noise prediction model initialized with existing traffic data provided by Wilbur Smith Associates and calibrated with the L_{eq} measurement and simultaneous traffic count data taken during the survey. "NA" is shown for non-residential sites, as 24-hour noise levels were not used for these sites.

Source: EIP Associates, 1996.

As shown in Table III.F.1, p. III.117, the noise-sensitive land uses in this analysis were primarily residential, but also included a school (the Filipino Educational Center), a children's day care facility (the Marin Day School in Hills Plaza), and a church (Saint Gregory's on Potrero Hill). In general, the exterior L_{dn} on busy streets with residential uses in the traffic study area ranged from 66 to 79 dBA. The one-hour L_{eq} during the weekday afternoon at all sites measured ranged from 61 to 78 dBA. Noise near the church on Potrero Hill was found to be slightly louder than might be expected in a residential neighborhood at 61 dBA, probably from cars accelerating uphill.

These measured and calculated noise levels are representative of outdoor conditions at sites in the areas surrounding the ballpark site. They permit calculation of the increases in traffic noise levels due to the project alone and due to a combination of the project's traffic with cumulative traffic growth that is expected to occur in the area as a result of future development. Outdoor noise levels at other locations near the measurement sites are likely to be similar, although differences in noise levels occur when there are intervening structures blocking some of the traffic noise, when a building is set back substantially further from the street than a measuring site at a building that is immediately adjacent to the sidewalk, or when traffic volumes are lighter than those on the streets studied in the noise analysis.

Existing Baseline Noise Conditions for Crowd/Event Analysis

Measurements of ambient noise levels were made in July and August, 1996, at three residential locations to determine the existing noise levels during afternoons and evenings—the times when most baseball games and other events would occur at the proposed ballpark.[9] These measurements were made for several days at each location; the information obtained establishes the average noise level over the course of the day (expressed as CNEL, providing a 24-hour average noise level with "penalties" added to account for noise sensitivity in the evening and at night) as well as an hourly L_{eq} for each site for weekday and

weekend afternoons and evenings. The three sites are shown on Figure III.F.1, p. III.116, as "A," "B," and "C." Establishing existing ambient noise levels for afternoon and evening time periods provides a baseline for analyzing crowd and amplified noise from the ballpark during ballgames or during occasional music events.

Table III.F.2 summarizes the results of the measurements of existing noise levels at the three measured residential locations. As would be expected in an urban area such as San Francisco, sites on heavily traveled streets show higher noise levels than those on less busy streets.

TABLE III.F.2
MEASURED AMBIENT NOISE LEVELS IN RESIDENTIAL AREAS NEAR THE PROJECT SITE

		Existing Ambient Noise Level (dBA)					
		Monday - Friday			Saturday - Sunday		
		L_{eq}			L_{eq}		
	Location[1]	Afternoon	Evening	CNEL	Afternoon	Evening	CNEL
A	Potrero Hill	57	55	59-63	55	55	59-60
B	Townsend & Clyde	70	67	70-73	68	66	72
C	Townsend & Kelly Jr.	66	62	68	65	61	66-67

1. See Figure III.F.1 for a map showing these locations.

Source: Wilson, Ihrig & Associates, Inc., *San Francisco Pacific Bell Park at China Basin Acoustical Analysis of Impact from Stadium Noise*, February 1997.

Location A (approximately 6,800 ft. from the center of the ballpark site) is on Texas Street near Nineteenth Street in the Potrero Hill residential neighborhood. The long-term monitoring at this site, conducted over ten consecutive days, shows that there is not much variation in afternoon and evening noise levels over the course of a week. While the noise levels varied a small amount from day to day, the typical weekday hourly L_{eq} was approximately 57 dBA in the afternoon and 55 dBA in the evening, while the typical

weekend hourly L_{eq} was 55 dBA during the afternoon and evening. The CNEL ranged from 59 to 63 dBA during weekdays and from 59 to 60 dBA during weekend days. These levels are consistent with those expected for urban residential areas on streets that have relatively low amounts of traffic.[10] The site is affected by noise from Interstate 280, located between the proposed ballpark site and the Potrero Hill neighborhood. U.S. 101 is located west of the measurement location; topography shields the site from exposure to this noise source.

Location B (approximately 1,100 ft. from the center of the ballpark site) is near the San Francisco RV Park. The CalTrain terminal at Fourth and Townsend is approximately 700 ft. away. A large amount of traffic turns onto Third Street from the northbound I-280 exit at Fourth and Berry Streets; because the area is urban/industrial, the traffic on Third Street and on Townsend Street includes many trucks and buses.[11] The long-term noise measurements, taken over a period of five consecutive days, indicate that the difference between weekday and weekend afternoon hourly L_{eq} levels (70 dBA and 68 dBA, respectively) is greater than that between weekday and weekend evening hourly L_{eq} (67 dBA for weekday evenings and 68 dBA for weekend evenings). The 24-hour average CNEL varied between 70 dBA and 73 dBA during weekdays and was 72 dBA on the weekend day. These levels are consistent with noise expected in urban residential areas on busier streets. Areas within the RV Park (the measuring instruments were set up outside of and adjacent to the RV Park) would be expected to be approximately 5 dB less than those reported, due to greater distance from the traffic noise sources on the streets and due to trees and cars/trailers between some observers and the traffic on the street.

Location C (approximately 900 ft. from the center of the ballpark site) is near the South Beach Marina Apartments and the Steamboat Point Apartments. The nearby Embarcadero roadway is a major thoroughfare. Second and Townsend Streets also carry large traffic volumes.[12] The area is mainly multi-family residential with a mixture of commercial and industrial uses; traffic on local streets includes many trucks. Construction activity is also occurring in the area, possibly adding to truck activity. The long-term noise measurement,

taken over a five-day period, indicates that weekday and weekend afternoon hourly L_{eq} are about the same at 66 dBA and 65 dBA, respectively. The evening hourly L_{eq} are also about the same on weekdays and weekends at 62 dBA and 61 dBA, respectively. The 24-hour measurement, reported in CNEL, is 68 dBA during weekdays and ranged from 66 dBA to 67 dBA during the weekend. These levels are consistent with those expected in urban residential areas. Noise levels outside apartments that do not face the street and that are, therefore, shielded from direct exposure to traffic noise, are expected to be about 5 dB less than those measured.

Both existing traffic noise measurements and ambient noise measurements were taken at outdoor locations and measure exterior noise. In general, interior noise with windows closed is quieter than exterior noise, because building walls and windows provide a barrier to exterior noise. Newer buildings, such as the Steamboat Point Apartments, were built under the requirements of Title 24 of the California Code of Regulations, which requires noise insulation to be included in residential building plans to ensure that interior noise levels will be at 45 dBA or below under normal conditions. Older buildings may have been constructed prior to the adoption of these regulations (before the mid-1970s); while building walls and windows provide a barrier to exterior noise, they may be less effective than newer buildings.

NOTES - Noise

1. A decibel is the standard unit of sound amplitude, or loudness; decibels are measured on a logarithmic scale, similar to the scale used to measure earthquake intensity. A logarithmic scale is a non-linear scale; for decibels, each increase in 10 dB multiplies the previous value by 10, for example 50 dBA is 10 times louder than 40 dBA while 60 dBA is 100 times louder than 40 dBA.

2. L_{eq}, the equivalent steady-state sound level, is the average acoustic energy content of noise for a stated period of time. The L_{eq} of two different time-varying noise events are the same if the events deliver the same acoustic energy to the ear during exposure, no matter what time of the day or night they occur, unlike some other measurements that adjust for differences in noise sensitivity at night.

3. L_{dn} is a day-night average noise level, a 24-hour average L_{eq}; it takes into account the greater annoyance of nighttime noise with a 10 dBA "penalty" added during the hours of 10:00 p.m. to 7:00 a.m.

4. CNEL is a community noise equivalent level 24-hour average noise similar to L_{dn} but with an additional 5 dBA "penalty" added during the hours of 7 p.m. to 10:00 p.m. to account for sensitivity to nighttime noise.

5. Appendix D of this EIR, p. A.137, includes a brief discussion of noise information from some federal and state agencies.

6. City and County of San Francisco, *General Plan, Environmental Protection Element*, p. I.6.17.

7. Whether a site has a view of the proposed ballpark site is important because sound levels are reduced by distance from the source, but are also reduced when there are intervening structures or topography between the listener and the noise source. For example, a hill will block freeway noise for residences on the side away from the freeway. If the listener is "around the corner" from a noise source, with a building in between the source and the listener, noise levels are reduced more than if the listener is the same distance from the source but can still see it. A site where the ballpark is directly visible is more likely to hear sounds from the ballpark than a site that is blocked by intervening buildings.

8. The SOUND32 computer model developed by California Department of Transportation was used, which is an adaptation of the Federal Highway Administration's Highway Traffic Noise Prediction Model (FHWA-RD-77-108).

9. Wilson, Ihrig & Associates, *Acoustical Analysis of Impact from Stadium Noise*, February 1997, provides more detail on these measurements in Section 3.

10. The traffic volume was low on Texas Street, as it is not a main route through the Potrero Hill district. While observations of traffic were not made during most of the time that long-term measurements were taken, short-term measurements were made at this site on Friday, August 2, 1996, from 8:42 to 8:52 p.m., during which observations of noise sources were recorded. One automobile passed by on Texas Street, and two airplanes passed overhead; the L_{eq} for the measurement period of 10 minutes was 55 dBA, correlating well with the long-term measurements for a weekday evening.

11. In addition to the long-term noise measurements at this site, a short-term measurement was taken at the RV Park site for 10 minutes on Friday, August 2, 1996, from 8:03 to 8:13 p.m. and observations of noise sources were made. During that 10-minute measurement period, 48 automobiles, 2 electric buses, 4 diesel buses and 8 motorcycles passed by, train horn soundings from the CalTrain Depot were distinctly audible, and two airplanes passed overhead; the L_{eq} was 68 dBA.

12. As explained in notes above, the long-term noise measurements did not include observations of noise sources during the multi-day measurement period. However, short-term measurements were made, with observations of noise sources, on August 2, 1996, between 8:20 and 8:30 p.m. During that 10 minutes, 29 automobiles passed the monitoring location; the L_{eq} was 60 dBA.

G. AIR QUALITY

Federal and state regulatory agencies set upper limits on the airborne concentrations of ozone, carbon monoxide (CO), nitrogen oxides (NO_x), sulfur oxides (SO_x), and small-diameter particulate matter (PM_{10}). Such upper limits or "ambient air quality standards" are designed to protect segments of the population most susceptible to the pollutants' adverse effects (e.g., the very young, the elderly, people weak from illness or disease, or persons doing heavy work or exercise). Federal and state standards for these are presented in Table III.G.1. The human health effects of these air pollutants are listed in Table III.G.2.

The 1970 Clean Air Act (CAA) gave the U.S. Environmental Protection Agency (U.S. EPA) the authority to set federal ambient air quality standards and required each state in violation of those standards to submit State Implementation Plans (SIPs) for their attainment. The CAA originally set a five-year deadline for federal standard attainment, but the deadline was moved forward by CAA Amendments of 1977 and 1990, in some cases to the year 2010, when many states had trouble meeting it.

The state passed the California Clean Air Act (CCAA) in 1988. The CCAA required the attainment of state ambient air quality standards by the "earliest practicable date" and established planning mechanisms, regulatory strategies, and standards of progress toward this goal.

The Bay Area Air Quality Management District (BAAQMD) takes primary responsibility for federal and state standard attainment planning, implementation, and enforcement in the Bay Area. Current plans for air quality improvement include the *Ozone and Carbon Monoxide Attainment/Maintenance Plans* (1993 and 1994), which address federal requirements, and the *Clean Air Plan* (1994), which addresses state requirements. Compliance strategies include stricter motor vehicle emission limits statewide, with local bi-annual motor vehicle inspection/maintenance and transportation control measures (TCMs).

TABLE III.G.1
FEDERAL AND STATE AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standard[1]	Federal Standard[2]
Ozone	1-hour	0.09 ppm	0.12 ppm
Carbon Monoxide	1-hour	20.00 ppm	35.00 ppm
	8-hour	9.00 ppm	9.00 ppm
Nitrogen Dioxide	1-hour	0.25 ppm	---
	Annual Average	---	0.053 ppm
Sulfur Dioxide	1-hour	0.25 ppm	---
	3-hour	---	1300 $\mu g/m^3$
	24-hour	0.04 ppm	365 $\mu g/m^3$
	Annual Average	---	80 $\mu g/m^3$
Suspended Particulate Matter (PM_{10})	24-hour	50 $\mu g/m^3$	150 $\mu g/m^3$
	Annual Geometric Mean	30 $\mu g/m^3$	---
	Annual Arithmetic Mean	---	50 $\mu g/m^3$

Notes:
ppm in this table refers to parts per million by volume, $\mu g/m^3$ in this table refers to micrograms per cubic meter.

1. California standards for ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide and particulate matter - PM_{10} - are values that are not to be exceeded.
2. National standards, other than for ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentration above the standard is equal to or less than one.

Source: California Air Resources Board, 1994.

Implementation of TCMs is particularly important because much of the Bay Area's air pollution comes from motor vehicles. Until recently, the BAAQMD enforced an Employer-based Trip Reduction Rule that required employers with 100 or more workers to develop programs to reduce drive-alone commute trips. But the recently passed Senate Bill 437 (Lewis)[1] now prohibits Air Districts and other public agencies from imposing requirements to implement a trip reduction program to mitigate air quality impacts, unless the program is expressly required by federal law and its elimination would result in the imposition of federal sanctions. The BAAQMD continues to promote employer-based trip reduction programs as a voluntary control measure.

TABLE III.G.2
HEALTH EFFECTS SUMMARY OF THE MAJOR CRITERIA AIR POLLUTANTS

Air Pollutant	Adverse Effects
Ozone	Eye irritation. Respiratory function impairment.
Carbon Monoxide	Impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin. Aggravation of cardiovascular disease. Impairment of central nervous system function. Fatigue, headache, confusion and dizziness. Can be fatal in the case of very high concentrations in enclosed places.
Nitrogen Dioxide	Risk of acute and chronic respiratory illness.
Sulfur Dioxide	Aggravation of chronic obstruction lung disease. Increased risk of acute and chronic respiratory illness.
Total Suspended Particulate Matter	Increased risk of chronic respiratory illness with long exposure. Altered lung function in children. With SO_2, may produce acute illness.
Suspended Particulate Matter	May be inhaled and possibly lodge in and/or irritate the lungs.

Source: BAAQMD, 1985.

REGIONAL CONTEXT

Regionwide elevated temperature inversions, caused when a layer of cool air is suspended between warm air layers above and below, are common in late summer and fall. Surface inversions, formed on winter nights when surface air cools faster than the air above it, are also common in many parts of the Bay Area, including San Francisco. When inversions coincide with low surface wind speed conditions, air pollutant levels rise. San Francisco's air quality benefits substantially from usually strong, direct maritime air flow, but, during calm periods, it can be adversely affected by pollutants emitted locally, particularly from motor vehicles.

The nine-county Bay Area Air Basin has a history of recorded violations of federal and state ambient air quality standards for ozone, CO, and PM_{10}. But since the early 1970s, substantial progress has been made toward controlling these pollutants. The U.S. EPA has recently designated the Bay Area as an attainment area for the federal ozone standard and is

considering a request for a similar designation with respect to the federal CO standard. The California Air Resources Board has designated the Bay Area as an attainment area for the state CO standard. Occasional violations of state ozone and PM_{10} standards still persist, however, and although further air quality improvement is anticipated, attainment is not anticipated within the current 20-year planning horizon.

Air Pollutant Problems in the Bay Area

Extensive industrial and urban development, and especially the widespread use of motor vehicles, are the major contributors to air pollution problems in the Bay Area.

Ozone

Ozone is a secondary pollutant which forms from the interaction of reactive organic gases (ROG) and nitrogen oxides (NO_x) in the presence of sunlight. Motor vehicles are the primary source of ROG and NO_x. Ozone standards have been violated most often in the Santa Clara, Livermore and Diablo Valleys because local topography and meteorological conditions favor the build-up of ozone and its precursors.

Carbon Monoxide

In 1995, about 65 percent of the carbon monoxide (CO) in the Bay Area was generated by motor vehicles.[2] The one-hour and eight-hour CO standards have been occasionally exceeded in San Francisco, San Jose and Vallejo, which are areas with high traffic volumes and frequent surface inversions during the winter months.

Particulate Matter

Particulate levels in the Bay Area are low near the coast, including San Francisco. Levels increase with distance inland and reach their highest levels in dry, sheltered valleys, such as the Santa Clara, Diablo, and Livermore Valleys. The largest human-caused sources are motor vehicle travel over paved and unpaved roads, demolition and construction activities, and agricultural operations and burning. Natural sources (i.e., wind-raised dust) are also significant. Particulate standards refer to particulates that are small enough to be inhaled (i.e., PM_{10}, those less than 10 microns in diameter). The state ambient air quality standards for PM_{10} are exceeded regularly in the Bay Area.

Nitrogen Oxides

The major sources of nitrogen oxides (NO_x) are vehicular, residential, and commercial fuel combustion. Concentrations of nitrogen dioxide (NO_2), the most abundant form of ambient NO_x, are highest in the South Bay. NO_2 standard violations have not been measured at any monitoring station in the Bay Area since the early 1980s.

Sulfur Dioxide

The burning of high sulfur fuels for activities such as electricity generation, petroleum refining and shipping are the major sources of sulfur dioxide (SO_2). The highest levels of SO_2 are recorded by monitoring stations located in a relatively narrow crescent along the bayshore of northern Contra Costa County, where major petroleum refineries are located. The SO_2 standard is currently being met throughout the Bay Area.

Pollutant Trends in the Bay Area

The BAAQMD has compiled ROG, NO_x, CO, PM_{10}, and SO_2 emission inventories and projections for the major pollutant sources in the Bay Area for the years 1995, 2000, and 2010 (see Table III.G.3). The substantial reductions apparent in the ROG, NO_2, and CO emissions are attributed to the stringent emission controls that have been or will be imposed on motor vehicles and stationary sources. PM_{10} is the only pollutant that shows a steady increase, mostly due to the growth in motor vehicle travel foreseen for the Bay Area. The BAAQMD emissions projections assume the following:[3]

- Population, housing, employment, economic growth, and land use will increase as regionally forecast;[4]
- Cars will become cleaner, as required by California regulations;
- The recently improved "Smog Check" program will continue;
- Controls on industry and business will continue; and
- Current transportation control measures will continue.

AIR POLLUTANT CONCENTRATIONS IN THE PROJECT SITE VICINITY

The BAAQMD operates monitoring stations at 10 Arkansas Street at the foot of Potrero Hill, about a mile southwest of the project site, and at 939 Ellis Street, about 2 miles northwest of the project site. Table X.E.1, in Appendix E. Air Quality, summarizes the most recent five years of available data. The following conclusions can be drawn from these data: Ozone, CO and NO_2 levels near the monitoring stations have not exceeded federal or state standards for the past five years; and PM_{10} levels near the monitoring stations occasionally exceed the state 24-hour standard, but not the federal standard.

TABLE III.G.3
BAY AREA CRITERIA POLLUTANT EMISSIONS PROJECTIONS
(Tons/Day - Annual Average)

	CO	ROG[1]	NO_2	SO_2	PM_{10}[2]
1995					
Total Emissions	2425	535	454	102	462
Motor Vehicle Emissions	1598	242	200	10	321
(Motor Vehicle's Percent of Total)	(66%)	(45%)	(44%)	(10%)	(70%)
2000					
Total Emissions	1963	464	441	107	501
Motor Vehicle Emissions	1108	166	171	10	355
(Motor Vehicle's Percent of Total)	(56%)	(36%)	(39%)	(9%)	(71%)
2010					
Total Emissions	1600	406	449	115	582
Motor Vehicle Emissions	697	88	161	12	427
(Motor Vehicle's Percent of Total)	(44%)	(22%)	(36%)	(10%)	(73%)

Notes:
1. Reactive organics (excluding emissions from natural vegetation).
2. Including entrained road dust.
(Projections are based on the Base Year 1990 Air District Emission Inventory.)

Source: BAAQMD and ABAG, *Improving Air Quality Through Local Plans & Programs*, October 1994.

Because ozone levels vary slightly over distances of several miles, the maximum concentrations measured at Arkansas Street probably are close to maximum ozone levels experienced in the project site vicinity. CO and PM_{10} levels are more responsive to nearby sources, particularly traffic, the largest source of both pollutants. Traffic volumes on Van Ness Avenue and Ellis Street, where the BAAQMD CO monitoring station is located, are higher than those on Berry and Third Streets adjacent to the project site. But U.S. 101 and I-280, both major freeways, pass close to the project site. Thus, the maximum CO levels at the monitoring station would be comparable to the maximum CO experienced in the project site vicinity. The same could be said about PM_{10} levels given the similarity in local traffic conditions. BAAQMD pollutant level contour maps generally confirm these judgments.[5]

NOTES - Air Quality

1. Chapter 607, 1995 stats., codified as Section 40929 of the Health and Safety Code.

2. Bay Area Air Quality Management District and Association of Bay Area Governments, *Improving Air Quality Through Local Plans and Programs*, October 1994, Appendix C, Table C.III, Motor Vehicle Share of Criteria Contaminant Emissions.

3. Bay Area Air Quality Management District and Association of Bay Area Governments, *Improving Air Quality Through Local Plans and Programs*, October 1994, p. C-3.

4. Association of Bay Area Governments, *Projections '94,* December 1993.

5. Bay Area Air Quality Management District and Association of Bay Area Governments, *Improving Air Quality Through Local Plans and Programs*, October 1994, Appendix C, Figures C.4.a, C.4.b and C.4.c.

H. SEISMICITY

GEOTECHNICAL INVESTIGATIONS

A geotechnical investigation focusing on foundation conditions and seismic response was conducted at the site of the proposed ballpark by Treadwell & Rollo, environmental and geotechnical consultants.[1] The field investigation included drilling seven test borings to depths between 41 and 122 feet (ft.) below ground level to sample and record subsurface soil conditions at the site; digging four test pits about 11 ft. deep to observe the existing pile caps and the condition of the timber piles beneath Pier 46B; and performing four cone penetration tests (see Glossary, pp. III.142 - III.145) between 61 and 86 ft. deep to characterize further the soil conditions behind the bulkhead along China Basin Channel (adjacent to Pier 46B). The borings and pits were logged during drilling and digging, and subsoil samples were classified visually and tested for various characteristics related to their ability to support the proposed structures. Soil and groundwater conditions encountered during the field testing were recorded. Laboratory testing included examining soil physical properties such as moisture content, density, strength, compressibility, and corrosiveness. These field and lab tests provided technical data used to formulate recommendations for seismic-resistant design of foundations, basement walls, and the above-ground structure. Geo-seismic databases and research of previous investigations provided information on site-specific, local and regional geology, and on regional faults and seismic activity needed to complete the recommendations. These recommendations, which are included as part of the project, cover each geotechnical issue related to the design of the proposed ballpark, including seismic-resistant design considerations for foundation support such as lateral loading, liquefaction, settlement, soil profile and near-fault factors. Unless otherwise noted, information in this section is derived from the report of those geotechnical investigations, or conversations with the authors of the report.[2] Several terms pertinent to San Francisco's seismic conditions, used in the remainder of this discussion, are defined in the Glossary subsection (see Glossary, pp. III.142 - III.145).

REGIONAL CONDITIONS

The Coast Ranges province, bounded on the west by the continental shelf and on the east by the Great Valley, is one of the most active seismic regions in the United States. Numerous low- and moderate-intensity earthquakes occur within this region every year. About a dozen large-intensity and great earthquakes, causing deaths and property damage, have occurred during recorded history. The major fault zones in the San Andreas fault system (as discussed in the Fault Location and Activity subsection, pp. III.133 - III.134) are the sources of these earthquakes, and are likely to be the sources of future earthquakes.[3] The active fault zones that cause these earthquakes affect development in San Francisco, even though no known traces of active faults pass through the City. New facilities for human occupancy are required to be designed to withstand the anticipated effects of seismic vibration (groundshaking) generated by these faults.[4]

FAULT LOCATION AND ACTIVITY

In discussing fault activity, it is necessary to introduce two descriptive terms, "moment magnitude" and "characteristic earthquake" (see Glossary, pp. III.142 - III.145).[5] With the increased flow of information from studies of recent large earthquakes (e.g. Loma Prieta, Northridge, Kobe), it has become necessary to define more precisely the seismic conditions in which planning and development occur, particularly in California. This has been accomplished largely through major revisions to the Uniform Building Code (1994) and the San Francisco Building Code (1995). The current building codes rely on these more-specific terms to increase their accessibility to those who design, construct, and inspect buildings to meet the standards of the codes. Their increasing use in planning documents facilitates document review by city and state agencies responsible for oversight of geotechnical and structural design issues.

The San Andreas, Seal Cove-San Gregorio, Hayward, and Calaveras fault zones (9 miles southwest, 20 miles west, 10 miles northeast, and 22 miles east of the proposed ballpark site, respectively) are historically active faults (during the last 200 years) in the San Andreas fault system. The San Francisco Peninsula segment of the San Andreas fault and the Seal Cove-San Gregorio fault are capable of generating a characteristic earthquake of moment magnitude (M_w) 7.1 (see Glossary, pp. III.142 - III.145); the Hayward fault, M_w 7.3; and the Calaveras fault, M_w 6.9.[6] Earthquakes of these magnitudes are sufficient to create ground accelerations (see Glossary, pp. III.142 - III.145) greater than 0.5g (50 percent of the acceleration of gravity) in bedrock or in unconsolidated sediments, which are severe enough to cause major damage to structures, foundations, and underground utility lines.[7] The April 18, 1906 earthquake, which ruptured all three segments of the San Andreas fault in the Bay Area, has been estimated at about M_w 8 (about M 8.3 on the Richter scale). The Loma Prieta earthquake of October 17, 1989 on the Santa Cruz segment of the San Andreas fault was measured at M_w 6.9 (Richter magnitude M 7.1).

After the 1989 Loma Prieta earthquake, the U.S. Geological Survey estimated the probability of at least one large earthquake (Richter magnitude M 7 or greater) in the San Francisco Bay region within the 30-year period between 1990 and 2020 at about 67 percent.[8] Recent studies by the U.S. Geological Survey indicate, unofficially, that the probability may be as high as 90 percent.[9] On the San Francisco Peninsula segment of the San Andreas fault, the probability that a large earthquake would occur in this time-frame is estimated at about 23 percent.[10]

SEISMIC HAZARDS

Groundshaking

The direct effects of seismically-induced groundshaking result from a combination of the cyclic horizontal and vertical movements of the ground during an earthquake, the coherence of the geologic material being shaken, and the quality of construction supported on that

material. Seismic ground motions range from very low intensities which cannot be detected, except by specialized equipment, to high intensities that can cause buildings to be shaken apart and heavy objects to be thrown into the air. A single earthquake can create the entire range of effects, depending on the moment magnitude of the earthquake, a given site's distance from the source of the earthquake, the geologic conditions at the site, and the design of the buildings on the site. Bedrock formations (such as the Franciscan sandstone deep beneath the site of the proposed ballpark) tend to be less affected by groundshaking than are unconsolidated sediments (such as the sand, mud, and artificial fill overlying the bedrock at the site).

As a general rule, the intensity of groundshaking increases with proximity to the source of the earthquake. However, given similar location and seismic energy output, the least amount of damaging vibration would occur on a site that was completely composed of bedrock. A site underlain by major thicknesses of sediments (such as the fill, estuarine, alluvial and marine sequence beneath the proposed ballpark site) would experience more severe vibration because of the sediments' tendency to deform to a greater degree than the bedrock.[11] For structures supported on sediments, the combination of ground deformation and susceptible building design (including foundation design) appears to determine the extent of damage, with well-constructed buildings founded on dense undisturbed native deposits performing considerably better than moderately or poorly constructed buildings on unengineered fill.[12]

Liquefaction

In San Francisco, the potential for liquefaction (see Glossary, pp. III.142 - III.145) poses a substantial hazard in areas of old artificial fill for two reasons: lack of fill compaction, and lack of fill content control. Much of the old artificial fill was placed along the waterfront before modern engineering methods of compaction were developed or known to be needed. Essentially, any available material was dumped into the Bay at the shoreline until the new land surface was above high-tide level. The result was a loose, saturated deposit composed

of irregular pockets of sand, gravel, rock, brick, lumber, or other disposed material. Only light structures could be supported on such substrate because almost any weight caused the fill to settle. During seismic groundshaking, vibration can cause this type of fill to settle or liquefy under certain conditions. Such conditions do not exist throughout all filled areas, but because there is no record of what was used for fill at most sites along the former shoreline, only site-specific geotechnical investigations can demonstrate the presence or absence of liquefiable material (see Subsurface Conditions, pp. III.141 - III.142). The fill at the site of the proposed ballpark is loose to very loose material which is subject to liquefaction.

Lateral Spreading

The presence of Bay Mud (see Glossary, pp. III.142 - III.145) is closely associated with waterfront areas of old artificial fill and is another factor in the potential liquefaction hazard. The old waterfront contained some relatively deep basins that were filled as the man-made land area expanded. The upper portions of the Bay Mud deposits that form the floors of those basins are as much as 50 percent water and contain layers of uniformly fine sand. The actual "mud" reacts to seismic shaking by spreading, undulating and settling, but the sand layers, possessing all the conditions of a liquefiable deposit, can and do liquefy, compromising the integrity of any foundations supported on them or on the overlying fill. Again, the layers of fine sand do not exist throughout all Bay Mud deposits, but only site-specific geotechnical investigations can demonstrate their presence or absence.

Tsunami

The amount of damage caused by tsunamis and seiches (see Glossary, pp. III.142 - III.145) in the San Francisco Bay Area has been small, but the potential for damage exists all along the City's waterfront. Prior to the 1989 Loma Prieta earthquake, tsunamis and seiches had been considered phenomena associated with earthquakes distant from the Bay Area (such as

the 1964 Alaska earthquake) because the mode of faulting along California's coast generally did not cause vertical disruptions of the sea floor.[13] The Loma Prieta earthquake did not cause a tsunami, but did create a 6-inch seiche effect in Monterey Bay, demonstrating that the phenomenon can be associated with earthquakes on local faults.[14]

Computer models of tsunami run-up elevations (see Glossary, pp. III.142 - III.145) have been prepared by the U.S. Army Corps of Engineers (Corps),[15] but the maximum calculated run-up levels have never been recorded in the City.[16] The Corps' calculations indicate that the site of the proposed ballpark would be subject to 4.8 ft. of wave run-up during the 100-year event, and 8.0 ft. of wave run-up during the 500-year event.[17] Because the site is between 8 and 12 ft. above mean sea level (-0.3 to +3.7 ft. San Francisco City Datum), and the maximum expected flood elevation from 4.8 ft. of run-up would only reach 7.75 ft. above mean sea level during extreme high tide crest conditions (-0.91 ft. San Francisco City Datum), no portion of the site would be threatened by the 100-year tsunami event.[18] The lowest portions of the site could be subject to more than 2 ft. of flooding during the 500-year tsunami or seiche, if the event occurred during an extreme high tide because this event could cause flood elevations to reach 10.95 ft. above sea level (+2.29 ft. San Francisco City Datum). Extreme high tide crest conditions occur about 30 times each year, and last for about 2 hours each time. Consequently, the statistical probability of a 500-year tsunami or seiche reaching the site at the crest of an extreme high tide period is less than two thousandths of one percent (0.002 percent).

SITE CHARACTERISTICS

Regulatory Background

Two major pieces of state legislation regulate construction near active fault traces: the Alquist-Priolo Earthquake Fault Zoning Act[19] and the Seismic Hazards Mapping Act.[20] The purpose of the Earthquake Fault Zoning Act is to reduce the hazards posed by surface

rupture of a fault. This law has resulted in preparation of maps delineating Earthquake Fault Zones of appropriate width to include known active segments of all the major faults in the Bay Area, none of which pass through the City of San Francisco. The site of the proposed ballpark is not in an Alquist-Priolo Earthquake Fault Zone, and no Earthquake Fault Zones trend toward the site. Consequently, the purpose of the Act (that structures not be placed across known active fault traces) is fulfilled within the site.

The purpose of the Seismic Hazards Mapping Act is to protect the public safety from the effects of strong groundshaking, liquefaction, landslides, or other ground failure, and other hazards caused by earthquakes. The Act requires the State Geologist to delineate the various seismic hazards zones and requires cities, counties, and other local permitting authorities to regulate certain development projects within these zones. Development permits for a site within a seismic hazard zone must be withheld until a geotechnical evaluation of the site has been conducted and appropriate mitigation measures incorporated into the project plans. The site of the proposed ballpark is in a Liquefaction Hazard Zone, as designated on the Preliminary Seismic Hazards Map which covers most of the City of San Francisco.[21]

San Francisco uses a modified version of the California Building Code (Title 24, Part 2, CCR) to regulate seismic safety in its jurisdiction, encompassing the provisions for excavation, grading, slope stability, erosion control, foundation investigations, general design, and structural integrity. The San Francisco Building Code contains additions, amendments, and repeals that are specific to building conditions and structural requirements in San Francisco. Chapters 16 and A16 of the San Francisco Building Code deal with structural force design requirements, including (but not limited to) regulations governing seismic-resistant construction. Chapters 18, 33 and A33 deal with foundations, retaining walls, excavation and grading, including (but not limited to) requirements for foundation investigations, seismic-resistant design, stable cut- and fill-slopes, and drainage and erosion control. The portions of these chapters related to seismic safety are more stringent than the corresponding chapters of the California Building Code.[22] Because the site of the proposed

ballpark is under the jurisdiction of the City, the seismic-protection provisions of the current (1995) San Francisco Building Code would apply.

For the protection of the lives of its residents and visitors, the City has devised and adopted the *Community Safety Element* of the *San Francisco General Plan*. Life Safety Policy 4 of the Element directs the City to, "require geologic or soil engineering site investigations and compensating structural design based on findings, for all structures in Special Geologic Study Areas." Life Safety Policy 5 directs the City to, "modify permitted land uses and types of structures, where appropriate, according to geologic factors and consistent with levels of acceptable risk." These policies were established to meet Life Safety Objective 1, "reduce hazards to life safety, minimize property damage and economic dislocations resulting from future earthquakes." They are applied to all natural hazards in the Special Geologic Study Areas.[23] Because the site of the proposed ballpark is in the City's Special Geologic Study Areas for potential ground failure hazards (liquefaction) and potential inundation hazards (tsunami), the City may require special site investigations, beyond those required by the San Francisco Building Code, to establish appropriate engineering designs for the construction of the proposed ballpark.[24]

The Planning Commission currently is considering amendments to update the *Community Safety Element*. The updated Element will continue current policies that require new structures in areas where site conditions could pose an additional hazard, such as liquefaction or landslide, to be constructed to reduce the hazard. Proposed Policy 2-1 is "assure that new construction meets current structural and life safety standards." Policy 2-3 is "consider site soils conditions when reviewing projects in areas subject to liquefaction or slope instability."

To implement the Life Safety Policies, engineers and inspectors at the Department of Building Inspection (DBI) work closely with a developer's geotechnical team to ensure that all life safety issues related to seismic groundshaking are addressed by the special site investigations, and that appropriate recommendations are included in the geotechnical report. The recommendations are incorporated in the permit requirements for the proposed

development. Each proposed development site is evaluated individually, based on its actual surface and subsurface conditions, without the use of preconceived development formulae.[25]

Site Response

The Association of Bay Area Governments has created computer models of the damage expected from major earthquakes on various segments of San Francisco Bay Area faults. The models produce maps showing the effects of seismic groundshaking as zones which correspond to Modified Mercalli Intensities (see Glossary, pp. III.142 - III.145). The models for San Francisco indicate that a M_w 7.1 earthquake on the Peninsula segment of the San Andreas fault would cause moderate structural damage (MM Intensity VIII) at the site of the proposed ballpark: heavy structural damage (MM Intensity IX) would be caused by a M_w 7.3 earthquake that ruptured the entire length of the Hayward fault.[26] The effects of MM Intensity VIII groundshaking are general damage to ordinarily substantial buildings, including partial collapse; some damage to specially designed structures; twisting or fall of chimneys, factory stacks, towers, and unreinforced masonry walls; movement of frame houses on their foundations, if they are not bolted in place; breaking of tree limbs and decayed timber pilings; and cracking of wet ground. The effects of MM Intensity IX groundshaking are considerable damage to specially designed structures; great damage to ordinarily substantial buildings, including partial collapse; destruction of poorly built structures; and liquefaction, settlement and ground cracking of fill and other saturated fine sandy deposits.[27]

The analyses of expected seismic ground motion at the ballpark site performed by Treadwell & Rollo, based on criteria in the current (1994) Uniform Building Code (UBC), indicate very high horizontal and vertical forces would be experienced because of the "near-source" effect (the site is less than 10 miles from the San Andreas and Hayward faults) and the ground motion amplifying effects of soft underlying sediments (especially Bay Mud). Because these two effects would increase the horizontal and vertical forces at the site beyond the range established by standard UBC Seismic Zone Factors, site-specific modeling is necessary to set

design parameters for the seismic-restraint systems to be built into the foundation of the ballpark. This issue is discussed further in IV.H. Seismicity, p. IV.280.

Subsurface Conditions

Subsurface investigations by Treadwell & Rollo indicate that most of the site of the proposed ballpark is blanketed by about 20 ft. of very loose to loose sand and gravel fill containing various amounts of silt, clay and rubble. In the vicinity of the Port of San Francisco's storage yard and under Pier 46B the fill is between 30 and 40 ft. thick. The pier is underlain by hydraulic fill (see Glossary, pp. III.142 - III.145) consisting of very loose to medium-dense sand with various amounts of silt. Large-rock backfill was placed behind the bulkhead when it was constructed in 1922, and mixed soil-and-rock fill was placed adjacent to the rock backfill. Large-rock fill and mixed soil-and-rock fill was used to construct the South Beach Harbor seawall in 1924 by excavating a trench through the Bay Mud and backfilling it. Although most of the materials used in these filling operations are, in themselves, fairly sound, because little or no compaction was involved (other than that provided by gravity), much of the fill is loose and could not provide adequate support for foundation piles. Additionally, most of the fill is highly corrosive to untreated concrete and steel because of high chloride and sulfate concentrations in the soils used for fill.

Bay Mud underlies the fill across most of the site. At the intersection of Third and King Streets, near the edge of the old shoreline, no Bay Mud was deposited, and the fill is underlain by weathered shale bedrock. Beneath the pier, the Bay Mud was dredged prior to October 1921 for construction of the pier and bulkhead, and the fill is underlain by dense to very dense sand. The Bay Mud is 10 to 20 ft. thick where it is present. One exception is beneath the center of the Port's storage yard where much of the Bay Mud appears to have been displaced during filling, leaving it only about 2 ft. thick. Bay Mud is low in strength and could not provide adequate support for foundation piles. Like the fill, Bay Mud is highly corrosive to untreated concrete and steel.

Below the Bay Mud is a sequence of alluvium (dense to very dense sand) and Old Bay Clay (stiff sandy clay) overlying weathered shale bedrock. The sedimentary sequence thickens to the east from about 8 ft. near the intersection of Third and King Streets to about 95 ft. where the South Beach Harbor meets China Basin Channel. Both the sedimentary sequence and the bedrock are strong enough to provide support for foundation piles. On the eastern half of the site, friction piles (see Glossary, pp. III.142 - III.145) would be appropriate, driven between 50 and 80 ft. to develop support from the sedimentary sequence. On the western half of the site, end-bearing piles (see Glossary, pp. III.142 - III.145) would be appropriate, driven between 40 and 80 ft. to reach bedrock. Because the sediments beneath the eastern half of the site are strong enough and thick enough to support friction piles, there is no necessity to drive piles all the way to bedrock. On the western half of the site, bedrock is close enough below the ground surface to be reached economically with end-bearing piles.

Groundwater was encountered in three borings at depths between 1.5 and 12 ft. below the ground surface of the site. The shallowest depth appears anomalous, because it is a lens of water perched above the level of the general water table, which is 10 to 12 ft. below the ground surface. This may indicate the possible occurrence of similar lenses at the site, but probably reflects the lowering of the general water table caused by groundwater infiltrating the combined storm drain and sewer line under Berry Street through cracked joints or pipe segments (see III.J. Water Quality and Aquatic Ecology, p. III.175, for further discussion). In either case, the presence of water in loose granular materials such as the fill on the site produces conditions that could lead to liquefaction during seismic vibration.

Glossary

Alquist-Priolo Earthquake Fault Zone: In 1972 the State of California began delineating special studies zones (called Earthquake Fault Zones since January 1994) around active and potentially active faults in the state. The zones are revised periodically, and extend 200 to 500 ft. on either side of identified fault traces. No structures for human occupancy may be built across an identified active fault trace. An area of 50 ft. on either side of an active fault trace is assumed to be underlain by the fault, unless proven otherwise. Proposed construction within the Earthquake Fault Zone is permitted only following the completion of a fault location report prepared by a California Registered Geologist.

Bay Mud: A layered sequence of soft, plastic, expansive sediments forming the bottom of San Francisco Bay, consisting of clay- and silt-sized particles interspersed with stringers and pockets of peat, fine sand, and minor amounts of gravel, and having a water content ranging between 30 and 92 percent (commonly 50 to 60 percent in the uppermost 50 to 100 ft. of the deposit).

Characteristic Earthquake: The moment magnitude (see below) of the seismic event considered representative of a particular fault segment, based on seismologic observations and statistical analysis of the probability that a larger earthquake would not be generated during a given time frame. In the Bay Area, the characteristic earthquake for the Peninsula segment of the San Andreas fault has a moment magnitude (M_w) of 7.1; the entire Hayward fault, a M_w of 7.3; and the northern segment of the Calaveras fault, M_w 6.9. The term "characteristic earthquake" replaces the term "maximum credible earthquake" (see below) as a more reliable descriptor of future fault activity.

Cone Penetration Test: A soil analysis procedure in which a steel cone of standard shape and size is pushed into the soil at a project site. The force needed to advance the cone at a specified constant rate or for a specific distance is measured and recorded. The procedure provides a determination of the relative density of the soil, which is an indicator of the soil's ability to support the weight of structures built on the site.

End-bearing Piles: Columns of timber, steel or concrete which derive their support from being driven several inches into bedrock at the base of the column.

Friction Piles: Columns of timber, steel or concrete which derive their support from the mechanical resistance (friction) between the outer surface of the column and the dense soil material through which the column is driven.

Horizontal Ground Acceleration: The speed at which soil or rock materials are displaced by seismic waves. It is measured as a percentage of the acceleration of gravity (0.5g = 50 percent of 32 ft. per second squared, expressed as an horizontal force). *Peak* horizontal ground acceleration is the maximum acceleration expected from the characteristic earthquake predicted to affect a given area. *Repeatable* acceleration refers to the acceleration resulting from multiple seismic shocks. *Sustained* acceleration refers to the acceleration produced by continuous seismic shaking from a single, long-duration event.

Hydraulic Fill: Soil materials that have been excavated, transported, and flushed into place by moving water. Most hydraulic fills in tidal areas consist of silt and sand "vacuumed" from the floor of a bay by a suction dredge and pumped through hoses into areas enclosed by levees.

Liquefaction: A response to severe groundshaking that can occur in loose soils. This transformation from a solid state to a liquid state ("quicksand"), as a response to seismically-induced groundshaking, can cause ground settling and landsliding. Earthquake-induced liquefaction does not affect bedrock; however, it does affect certain types of alluvium and artificial fill under conditions of saturation. The characteristics of a liquefaction-prone deposit include: (1) uniformly fine sand or sandy soil; (2) saturated conditions — usually by groundwater; (3) loose to moderately dense compaction; (4) little or no clay-sized particles to act as binders. If these conditions occur within about 30 to 40 ft. below the ground surface, vibration sufficiently violent to increase pore pressure beyond the shear strength of the sand particles could cause such soils to liquefy. Any structures supported on the soils would be

subject to tilting or settlement (sometimes very violent and rapid) as the supporting capabilities of the liquefying soil diminished.

Maximum Credible Earthquake (MCE): The largest Richter magnitude (M) seismic event that appears to be reasonably capable of occurring under the conditions of the presently known geological framework. This term has been replaced by "characteristic earthquake," which is considered a better indicator of probable seismic activity on a given fault segment within a specific time frame.

Modified Mercalli Intensity (MMI) Scale: A 12-point scale of earthquake intensity based on local effects experienced by people, structures, and earth materials. Each succeeding step on the scale describes a progressively greater amount of damage at a given point of observation. Effects range from those which are detectable only by seismicity recording instruments (I) to total destruction (XII). Most people will feel Intensity IV ground motion indoors and Intensity V outside. Intensity VII frightens most people, and Intensity VIII causes alarm approaching panic. The scale was developed in 1902 by Giuseppi Mercalli for European conditions, adapted in 1931 by American seismologists Harry Wood and Frank Neumann for conditions in North America, and modified in 1958 by Dr. Charles F. Richter to accommodate modern structural design features.

Moment Magnitude (M_w): A logarithmic scale used by modern seismologists to measure the amount of energy released by an earthquake. For the purposes of describing this energy release (i.e. the "size" of the earthquake on a particular fault segment for which seismic-resistant construction must be designed) the moment magnitude (M_w) of the characteristic earthquake for that segment has replaced the concept of a maximum credible earthquake of a particular Richter magnitude. This has become necessary because the Richter scale "saturates" at the higher magnitudes; that is, the Richter scale has difficulty differentiating the size of earthquakes above M 7.5. The M_w scale is proportional to the area of the fault surface that shifts (slips) during an earthquake, and, thus is directly related to the length of the rupture. It reflects the amount of "work" (in the sense of classical physics) done by the earthquake. Although the numbers of the M_w scale may appear lower than those of the traditional Richter magnitudes, they convey more precise (and more useable) information to geologic and structural engineers.

Richter Magnitude Scale: A logarithmic scale developed in 1935 to 1936 by Dr. Charles F. Richter and Dr. Beno Gutenberg to measure earthquake magnitude (M) by the amount of energy released, as opposed to earthquake intensity as determined by local effects on people, structures, and earth materials (for which, see Modified Mercalli Intensity Scale). Each whole number on the Richter scale represents a 10-fold increase in amplitude of the waves recorded on a seismogram and about a 31-fold increase in the amount of energy released by the earthquake. Because the Richter scale tends to saturate above about M 7.5, it is being replaced in modern seismologic investigations by the moment magnitude (M_w) scale (see above).

Run-up (tsunami or seiche): The advance of water up the foreshore of a beach or structure, caused by a submarine disturbance (see tsunami and seiche, below). Maximum run-up levels for the 100-year and 500-year events adjacent to San Francisco Bay have been calculated by Garcia and Houston (see citation in endnotes) without regard for tidal effects, and, thus, reflect the flood elevation reached above the normal water surface of the Bay at the time the tsunami or seiche occurs.

Seiche: a standing-wave oscillation of the surface of water in an enclosed or semi-enclosed basin (such as a lake, bay, or harbor), that is initiated by landslides, earthquakes, or other geologic phenomena, and continues after cessation of the originating force.

Tsunami: a sea wave produced by any large-scale, short-duration disruption of the ocean floor, principally by a shallow submarine earthquake, but also by submarine earth movement, subsidence, or volcanic eruption.

NOTES - Seismicity

1. Treadwell & Rollo, Inc., *Draft Geotechnical Investigation, Pacific Bell Park, San Francisco, California*, September 4, 1996. A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

2. C. S. Shields, Geotechnical Engineer, Treadwell & Rollo, Inc., personal conversations, July 30 to October 4, 1996.

3. a) Jennings, C. W., *Fault Activity Map of California and Adjacent Areas, with locations and ages of Recent Volcanic Eruptions*, Geologic Data Map No. 6, California Division of Mines and Geology, 1994.

   b) Goter, S. K., *Seismicity of California, 1808 - 1987*, National Earthquake Information Center, U.S. Geological Survey, Open-File Report 88-286, 1988.

4. a) Seismology Committee, Structural Engineers Association of California, *Recommended Lateral Force Requirements and Tentative Commentary,* San Francisco, California, 5th edition, rev. June 30, 1988, p. 1.

   b) City and County of San Francisco Municipal Code, *Building Code*, adopted December 14, 1995, Chapter 16, Structural Forces, pp. 211 - 248.

5. These two descriptive terms may be less familiar than "Richter magnitude" and "maximum credible earthquake." They are not new terms, having been used by seismologic investigators for several years, but they embody concepts that provide more useful information about the seismic conditions in California and the Bay Area than the earlier terms. The calculations they represent are those actually used in geologic and structural engineering designs. They have not appeared often in planning documents because until recently the earlier terms generally were adequate for planning purposes.

6. Association of Bay Area Governments, *On Shaky Ground, City Maps: City of San Francisco*, Publication Number P95002EQK-SF-1, April 1995.

7. a) J. F. Davis, *et al.*, *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in the San Francisco Bay Area*, California Division of Mines and Geology, Special Publication 61, 1982.

b) R. D. Borcherdt, *et al.*, *Maximum Earthquake Intensity Predicted on a Regional Scale*, U.S. Geological Survey, Miscellaneous Field Investigations Map MF-709, scale 1:125 000, 1975.

8. Working group on California earthquake probabilities, *Probabilities of Large Earthquakes in the San Francisco Bay Region, California*, U.S. Geological Survey Circular 1053, 1990, p. 29.

9. Schwartz, D. P., and W. H. Bakun, Workshop: "Geologic Structures Beneath South San Francisco Bay - A Seismic Hazard?," U.S. Geological Survey Coordinating Organization for Northern California Earthquake Research and Technology (CONCERT), June 7, 1994, reported in *San Francisco Chronicle*, June 8, 1994, p. 1.

10. Working group on California earthquake probabilities, *Probabilities of Large Earthquakes in the San Francisco Bay Region, California*, U.S. Geological Survey Circular 1053, 1990, p. 29.

11. Borcherdt, R. D., J. F. Gibbs and K. R. Lajoie, *Map Showing Maximum Earthquake Intensity Predicted in the Southern San Francisco Bay Region, California, for Large Earthquakes on the San Andreas and Hayward Faults*, U.S. Geological Survey, Miscellaneous Field Studies Map MF-709, 1975, p. 11 and Sheet 2.

12. Montgomery, D. R., "Representative Damage Photographs from the Loma Prieta Earthquake," in: *The Loma Prieta (Santa Cruz Mountains), California, Earthquake of 17 October 1989*, S. R. McNutt and R.H. Sydnor, editors, California Division of Mines and Geology, Special Publication 104, 1990, pp. 113 - 120.

13. Pierzinski, D., "Tsunamis," in: *California Geology*, California Division of Mines and Geology, Vol. 33, No. 3, March 1981, pp. 58 - 61.

14. Dr. E. B. Thornton, Department of Oceanography, Naval Post-Graduate School, telephone conversation, October 31, 1991.

15. Garcia, A.W., and J. R. Houston, *Type 16 Flood Insurance Study: Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound*, U.S. Army Corps of Engineers Technical Report H-75-17, Hydraulics Laboratory, U.S. Army Engineers Waterways Experiment Station, Vicksburg, Mississippi, November 1975, pp. 4-6.

16. City and County of San Francisco, *San Francisco General Plan, Community Safety Element,* adopted by Resolution 7241 of the City Planning Commission, September 12, 1974, pp. 10, 11.

17. Garcia, A.W., and J. R. Houston, *Type 16 Flood Insurance Study: Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound*, U.S. Army Corps of Engineers Technical Report H-75-17, Hydraulics Laboratory, U.S. Army Engineers Waterways Experiment Station, Vicksburg, Mississippi, November, 1975, Figure 56.

18. Maximum run-up levels for the 100-year and 500-year events adjacent to San Francisco Bay have been calculated by Garcia and Houston (see previous endnote) without regard for tidal

effects, and, thus, reflect the flood elevation reached above the normal water surface of the Bay at the time the tsunami or seiche occurs. For the 100-year event at the proposed ballpark site, 4.80 ft. of tsunami run-up occurring during an extreme high tide (any tide rising at least 1.75 ft. above mean sea level) would result in a flood elevation at least as high as 6.55 ft. above mean sea level (4.80 + 1.75 = 6.55). This elevation translates to -2.11 ft. San Francisco City Datum, because mean sea level is 8.66 ft. below the City datum (-8.66 + 6.55 = -2.11). Extreme high tides of +2.95 ft. above mean sea level (-5.71 ft. San Francisco City Datum) occur every winter in San Francisco Bay, so the maximum estimated flood elevation from 4.80 ft. of tsunami run-up during the maximum expected extreme high tide would be 7.75 ft. above mean sea level (4.80 + 2.95 = 7.75), or -0.91 ft. San Francisco City Datum. For the 500-year event, 8.00 ft. of tsunami run-up during the maximum expected extreme high tide would result in an estimated flood elevation of 10.95 ft. above mean sea level (8.00 + 2.95 = 10.95), or 2.29 ft. San Francisco City Datum.

19. *Alquist-Priolo Earthquake Fault Zoning Act*, California Public Resources Code, Division 2. "Geology, Mines and Mining," Chapter 7.5 "Earthquake Fault Zones," Sections 2621 through 2630; signed into law December 22, 1972, amended 1974, 1975, 1976, 1979, 1991, 1993, 1994. Prior to 1994 this legislation was known as the Alquist-Priolo Special Studies Zones Act.

20. *Seismic Hazards Mapping Act*, California Public Resources Code, Division 2. "Geology, Mines and Mining," Chapter 7.8, effective date April 1, 1991.

21. California Division of Mines and Geology, *State of California Seismic Hazard Zones, South Half of the San Francisco North and Part of the Oakland West Quadrangles*, released March 1, 1996, scale 1:24,000.

22. City and County of San Francisco Municipal Code, *1995 San Francisco Building Code*, adopted December 14, 1995, Chapters 16, 18, 33, A16 and A33.

23. City and County of San Francisco, *San Francisco General Plan, Community Safety Element,* adopted by Resolution 7241 of the City Planning Commission, September 12, 1974, p. 3.

24. City and County of San Francisco, *San Francisco General Plan, Community Safety Element,* adopted by Resolution 7241 of the City Planning Commission, September 12, 1974, pp. 9, 10, 11, and 16.

25. Charles Ng, Inspector, San Francisco Department of Building Inspection, telephone conversation, October 24, 1994.

26. Association of Bay Area Governments, *On Shaky Ground, City Maps: City of San Francisco*, Publication Number P95002EQK-SF-1, April 1995.

27. Association of Bay Area Governments, *On Shaky Ground, City Maps: City of San Francisco*, Publication Number P95002EQK-SF-1, April 1995.

I. CONTAMINATION AND ENVIRONMENTAL RISK

Existing contamination at the project site poses potential environmental and public health issues associated with the construction and operation of the proposed ballpark. As described further in this section, contamination exists in the soil and groundwater, as well as in buildings on the site. The existing structures may contain hazardous materials, and may also have associated storage tanks that contain hazardous materials. This contamination may pose public health risks, depending on the "pathway" of exposure, i.e. the means through which a person may come into contact with a hazardous material. Potential health risks to the public and workers posed by contamination are discussed in IV.I. Contamination and Environmental Risk, pp. IV.286 - IV.305.

Due to previous industrial uses on the site, a soil and groundwater investigation and risk evaluation for the ballpark site was performed by Geomatrix Consultants, Inc. (Geomatrix). The results of previous investigations and the site characterization performed by Geomatrix are summarized in this section after an overview of the regulatory environment.

DEFINITIONS

The term "hazardous material" is defined in different ways for different regulatory programs. For purposes of this EIR, the definition of "hazardous material" is similar to that given in *California Health and Safety Code*, Section 25501:

- Hazardous materials are materials that, because of their quantity, concentration, or physical or chemical characteristics, pose a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment.

For the purposes of this EIR, the definition of "hazardous waste" is the same as that given in *California Health and Safety Code*, Section 25117 and in *California Code of Regulations*, Title 22, Section 66261.2:

- Hazardous wastes are wastes that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may either cause, or significantly contribute to an increase in mortality or an increase in serious illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hazardous waste includes any waste that is hazardous due to toxicity, ignitability, corrosivity, or reactivity. The characteristics of toxicity, ignitability, corrosivity, and reactivity are defined in *California Code of Regulations*, Title 22, Sections 66261.20-66261.24 (see Glossary, p. III.162).

Excavated waste soil with concentrations of contaminants higher than certain acceptable levels must be handled and disposed of as hazardous waste. The *California Code of Regulations,* Title 22, Sections 66261.20-66261.33 contains numerical limits and technical descriptions of characteristics which deem a soil hazardous.

REGULATORY BACKGROUND

Hazardous materials handling and hazardous waste management are subject to many laws and regulations at all levels of government. Laws and regulations related to public health and safety are discussed in detail in Appendix F, Contamination and Environmental Risk, pp. A.146 - A.154. A brief summary of those regulations is provided here.

Worker Safety

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. California Division of Occupational Safety and Health Administration (Cal-OSHA) and the federal Occupational Safety and Health Administration are the agencies with primary responsibility for assuring worker safety in the workplace. Cal-OSHA has primary responsibility for developing and

enforcing standards for safe workplaces and work practices in California. A Site Health and Safety Plan must be prepared, prior to commencing any work at a contaminated site, to protect workers and the public from exposure to potential hazards.

Hazardous Waste Handling

The California Environmental Protection Agency (Cal-EPA) Department of Toxic Substances Control (DTSC) regulates the generation, transportation, treatment, storage, and disposal of hazardous waste under the federal Resource Conservation and Recovery Act (RCRA) and the California Hazardous Waste Control Law. Both laws impose "cradle to grave" regulatory systems for handling hazardous waste in a manner that protects human health and the environment. Hazardous wastes are required to be disposed of at licensed facilities. The DTSC permits and oversees all hazardous waste treatment, long-term storage (over 90 days), and disposal activities.

In San Francisco, remediation and clean-up of contaminated sites is performed with the oversight and with the cooperation of the City and County of San Francisco Department of Public Health (SFDPH), the San Francisco Bay Regional Water Quality Control Board (RWQCB) and the DTSC. The oversight agencies (RWQCB, DTSC and SFDPH) do not require remediation for this project. At sites where contamination is suspected or is known to have occurred, the consultants for the project sponsor perform a site investigation and draw up a remediation plan, if necessary. Site remediation, pursuant to *California Health and Safety Code*, Section 33459 *et seq.*, is typically done during the construction phase of the project. Groundwater remediation, where necessary, may take longer, often continuing after the construction phase. If additional contamination is discovered during excavation, the regulatory agencies may require that construction be halted while further studies are conducted.

Hazardous Materials Transportation

Although no hazardous wastes would be generated from operation of the proposed ballpark, excavation for the ballpark is expected to uncover contaminated soil that may be classified as hazardous waste if the excavated soil has contaminant concentrations higher than certain acceptable levels and requires off-site disposal. The *California Code of Regulations,* Title 22, Sections 66261.20-66261.33, contains technical descriptions of characteristics capable of rendering a soil hazardous. Transportation and disposal of soil that is classified as hazardous waste would be subject to applicable federal and state regulations. The U.S. Department of Transportation regulates hazardous materials transportation, including contaminated soil, between states. The California Highway Patrol and the California Department of Transportation (Caltrans) are the state agencies with primary responsibility for enforcing federal and state regulations and responding to hazardous materials (contaminated soil) transportation emergencies. Together, these agencies determine container types to be used and license hazardous waste haulers for hazardous waste transportation on public roads.

Maher Ordinance

Article 20, Section 1000 et. seq., of the *San Francisco Public Works Code*, entitled "Analyzing the Soil for Hazardous Waste," commonly known as the Maher Ordinance, requires building permit applicants proposing to disturb 50 cubic yards of soil or more eastward of the 1851 high tide line to conduct environmental assessments of that soil for possible hazardous waste. Where hazardous wastes are found in excess of state or federal standards, the permit applicant is required to submit a site mitigation plan prepared by a qualified expert to the Director of Public Health and the Director of Public Works, and must implement the site mitigation plan and certify completion prior to issuance of any building permit. Where hazardous wastes are found for which no standards are established, the permit applicant must request a determination from the Director of Public Health as to whether a site mitigation plan is needed. The proposed site for the ballpark is within the geographic area covered by this ordinance. Further details on the ordinance requirements are provided in Appendix F, Contamination and Environmental Risk, pp. A.152 - A.153.

Hazardous Building Materials

Asbestos

Federal and state laws and regulations govern handling of building materials that contain asbestos. Asbestos-containing material is regulated both as a hazardous air pollutant under the Clean Air Act (the primary pathway of exposure is inhalation) and as a potential worker safety hazard under the authority of Cal-OSHA. These regulations limit emissions of asbestos from asbestos-related manufacturing, demolition, or construction activities; require medical examinations and monitoring of employees engaged in activities that could disturb asbestos; specify precautions and safe work practices that must be followed to minimize the potential for release of asbestos fibers; and require notice to federal and local government agencies prior to beginning renovation or demolition that could disturb asbestos. The agencies with primary responsibility for asbestos safety are the Bay Area Air Quality Management District, Cal-OSHA, and the U.S. Environmental Protection Agency (U.S. EPA). Some state regulations on asbestos-containing materials are more stringent than federal regulations. For example, California requires licensing of contractors who conduct abatement activities.

Lead

Federal and state laws and regulations govern handling of building materials that contain lead-based paint. The Lead Construction Standard (Federal OSHA [29 CFR 1926.62] and Cal-OSHA [8 CCR 1532.1]) establishes a maximum safe exposure level for the following types of construction work where lead exposure may occur:

- Demolition or salvage of structures where lead or materials containing lead are present;
- Removal or encapsulation of materials containing lead; and
- New construction, alteration, repair or renovation of structures or substrates that contain lead or materials containing lead.

Polychlorinated Biphenyls

Regulation of polychlorinated biphenyls (PCBs) falls primarily under federal jurisdiction. The *Code of Federal Regulations*, Title 40, contains the Toxic Substances Control Act regulations for handling materials containing PCBs. This Act restricts the use and storage of PCB-containing transformers (defined as those containing at least 500 parts per million PCBs). The U.S. EPA also requires that all PCB-containing transformers be registered with local fire protection personnel, whether in use or in storage, and that they be inspected every three months. If a leak is found, it must be contained to prevent release and exposure, and then be eliminated. Manufacture of PCBs in the U.S. was discontinued in 1976.

CURRENT USES[1]

The site is currently occupied primarily by warehouse-type buildings. Various agencies, including Caltrans and the City and County of San Francisco, own a portion of the site.

The City and County of San Francisco holds in trust the portion of the site south of Berry Street; the buildings on that portion of the site are maintained and operated by the Port. A large two-story building is located adjacent to China Basin Channel at Pier 46B; the first floor of this building is currently occupied by the Port. The Port has been operating in this area for about 15 years. Various maintenance shops operated by the Port of San Francisco, including sheet metal, carpentry, plumbing, painting, electrical, piping, machining, and deep-water diving, are located on the first floor. The second floor is leased to various businesses, including an auto repair shop. A second building consisting of warehouse space is located north of the Pier 46B building; the Port of San Francisco leases this space to various businesses whose operations include storage and distribution of furniture, clothing, and petroleum products. The area between the two buildings is covered and primarily unpaved, and is used to store equipment and old vehicles. On the northeast side of this portion of the site is a lumber and equipment storage yard with both paved and unpaved areas.

Caltrans owns the portion of the site north of Berry Street. A paved parking area is present at the corner of Third Street and Berry Street. The site contains several large buildings east of the parking area. The space in these buildings is leased out to various small businesses or is currently unoccupied. The northern portions of the buildings have been demolished to complete the expansion of King Street in this area. The area north of the remaining building is paved and used for parking.

The City and County of San Francisco owns Berry Street.

SITE BACKGROUND

Fill History

Prior to 1853, the project site location was just offshore of the San Francisco shoreline. A hillside with an elevation of approximately 111 feet (ft.) above mean sea level was present at that time north of the site in the vicinity of Townsend Street and Second Street. The Citizens Gas Company began filling in the Bay in the 1860s to develop a coal gasification plant near the intersection of Townsend Street and Second Street. A second gas-manufacturing facility which operated until the early 1900s was built south of Townsend Street between Second Street and Third Street by the Pacific Gas Improvement Company.

During the early part of the development period between 1860 and 1887, the hillside was excavated to slightly above sea level. The excavated materials were used to fill the northern portions of the site between King Street and Berry Street. Prior to approximately 1913, the southern portion of the project site, located south of Berry Street, was still part of the Bay. This area was filled between 1913 and 1920. Sand from the Rincon Hill area was used to fill the area beneath Pier 46B. The source of fill in the triangular-shaped area between Berry Street and Pier 46B is not known but may have been rubble from the 1906 earthquake.

Historical Site Uses

The northern portion of the project site historically housed numerous industrial operations including a coal gasification plant, a printing shop, oil and paint works, oil and lead works, auto repair, an industrial chemicals and metals warehouse, a stone yard, a lumber yard, and a service station. After filling, the southern portion of the site contained a fumigation plant, a cold storage warehouse, a drug-manufacturing facility, and an auto service station. Various above-ground storage tanks (ASTs) and underground storage tanks (USTs) were also used at the project site.

Previous Environmental Investigations

Several environmental investigations (prior to Geomatrix characterization of the site) have been conducted at the project site during the past six years. Those investigations covered the area of the ballpark site generally north of Berry Street. A review of those reports[2] revealed that a total of 24 environmental borings were drilled and sampled for soil contaminants, and three groundwater monitoring wells were installed and sampled. A summary of the results and conclusions of those investigations is presented below. Groundwater quality is discussed in III.J. Water Quality and Aquatic Ecology, pp. III.176 - III.178.

The results of the previous investigations indicate elevated concentrations of lead, antimony, copper, and mercury at the project site throughout the block north of Berry Street. Because metals were randomly detected as opposed to being present at defined locations with specific past uses of hazardous materials, those chemicals may be associated more with the artificial fill under the project site than with past uses on the project site.

Elevated polynuclear aromatics (PNA) concentrations and black sediments were found in samples from soil borings in Second Street, midway between King Street and Berry Street, and in Berry Street, midway between Second Street and Third Street, indicating the presence of coal tar in that area.

High concentrations of total petroleum hydrocarbons (TPH) in the form of gasoline were detected in the northeast area of the project site. Benzene, toluene, ethyl benzene, and xylene (BTEX) compounds were also detected in various borings throughout the block north of Berry Street. Elevated concentrations of TPH in the form of motor oil were also detected in this area.

POTENTIAL SUBSURFACE CONTAMINATION

Based on information obtained during past investigations and site reconnaissance, Geomatrix initially identified areas of the project site with potential subsurface contamination, as shown in Figure X.F.1, Appendix F, Contamination and Environmental Risk, p. A.159. The site investigation was then designed to determine the nature and extent of contamination present beneath the site. The soil samples were analyzed for the chemicals that could be associated with historical site uses or are associated with the potential contamination identified at the project site. The results of the analyses are presented on pp. IV.290 - IV.295. Potential sources of subsurface contaminants identified from review of existing information and site reconnaissance include the following:

- USTs and ASTs. There are various locations at the project site where USTs and ASTs were used in the past (see Figure X.F.1, Appendix F, Contamination and Environmental Risk, p. A.159). Some of those USTs and ASTs have been removed but in some cases the status is unknown (see Figure X.F.2, Appendix F, Contamination and Environmental Risk, p. A.160). Associated chemicals that are anticipated in the soil and groundwater due to such operations include BTEX, PNAs, TPH, and volatile organic compounds (VOCs).

- Surface Stains. Heavy staining on cracked concrete floors was observed in several buildings located on Berry Street. Ground surface stains were also noted near a wash-pad/sump at the northeast corner of Pier 46B. Associated chemicals could include BTEX, PNAs, VOCs and metals.

- Fumigation Facility. A cyanide-containing piping system from the former fumigation facility was also noted at 95 Berry Street; associated chemicals anticipated in the area include cyanide and pesticides.

- Other Subsurface Contaminants. In addition, the site is known to have imported fill material of unknown origin, and has been the location of industrial and commercial

facilities involving use or storage of chemicals. Chemicals that could be associated with past site uses or the fill include VOCs, PNAs, metals, cyanide, asbestos, and phenols.[3]

HAZARDOUS BUILDING MATERIALS

Past investigations indicate the presence of potentially hazardous building materials in the existing buildings at the project site. Morrison-Knudsen Corporation (MKC) performed a preliminary site investigation for Caltrans which included collecting structural samples from buildings at 860 Second Street and 30 through 70 Berry Street to determine the presence of asbestos and lead-based paint. Another asbestos evaluation conducted by Woodward-Clyde Consultants (WCC) included collection of 10 to 20 samples and laboratory analysis as part of a Phase I Environmental Site Assessment for the property located on 35 through 65 Berry Street at Pier 46. WCC also conducted a PCB evaluation to identify transformers or other equipment present at the property that might contain PCBs. The findings of these investigations are summarized below.

Asbestos

All roofing materials in the buildings at 860 Second Street and 30 through 70 Berry Street contain asbestos. The building at 860 Second Street contains one area with 240 square feet (sq. ft.) of asbestos-containing insulation materials on an old heating duct. The building at 30 Berry Street contains a total of 550 sq. ft. of dilapidated asbestos on two abandoned hot water heaters and associated piping. No asbestos was detected in buildings at 36, 40, and 44 Berry Street during the investigation conducted by MKC. Approximately 500 sq. ft. of asbestos-containing aircell insulation in poor condition was found during site investigation on the first floor outside the office areas at 50 Berry Street. Linoleum samples also contain asbestos. The building at 66 Berry Street contains 800 sq. ft. of floor tile materials with 10 percent asbestos. The building at 70 Berry Street was found to have 200 sq. ft. of floor tile and mastic that contains 5 percent asbestos.[4]

Non-friable[5] asbestos-containing material was detected in bulk samples collected from interior roll-up doors and exterior window caulking in the buildings at 35 through 65 Berry Street.[6] Information regarding asbestos-containing materials in the remaining buildings at the ballpark site is not available. There is a high probability of finding asbestos-containing building materials in buildings constructed prior to the 1970s.

Lead

Analysis conducted during the MKC site investigation indicates that lead-based paint was used intermittently inside and outside the buildings at 860 Second Street and 30 through 70 Berry Street. Some of the samples exceed the California Department of Housing and Urban Development guidelines for lead in paint of 0.5 percent by 0.1 percent.[7]

PCBs

According to the Phase I Environmental Site Assessment conducted by WCC, there is a potential for PCBs in light ballasts and electrical switches in the warehouse building located at 35 to 65 Berry Street.

PROJECT SITE INVESTIGATION

Investigation Methodology

Soil and groundwater investigations typically begin with a search of public records, a visual inspection, and a review of environmental investigations performed previously in or near the project site. Geomatrix conducted a preliminary investigation for the ballpark site that included a review of historic data, aerial photographs, and Sanborn Fire Insurance maps[8]. This information was reviewed to identify potential nearby off-site and on-site sources of chemicals that may have affected soil or groundwater beneath the project site. A site

reconnaissance was also conducted to visually inspect the site for signs of environmental impairment. Several areas of soil staining were found, indicating possible contamination. The findings from the preliminary investigation are presented on pp. III.156 - III.157.

Because the site was formerly used for industrial and commercial purposes, the project site investigation conducted by Geomatrix considered the potential that petroleum products or industrial chemicals present in the site soil or groundwater could pose a risk to human health or the environment during or following construction of the proposed ballpark. The investigation activities were based on the *Work Plan for Investigation of the Giants Pacific Bell Park Site*, prepared by Geomatrix, dated April 1996, and subsequent addenda (Addendum 1, May 1996; Addendum 2, July 1996). Methods and procedures for the risk evaluation were described in the *Health Risk Evaluation Work Plan*, dated August 2, 1996. The objectives of this investigation were to:

- Investigate areas of the site that could present a complete exposure pathway between the possible on-site or off-site receptors and chemical-containing media;
- Evaluate the data to assess the potential risk to these receptors; and
- Determine compliance with the Maher Ordinance.

The results of the site investigations are presented in *Site Investigation Report and Risk Evaluation*, prepared by Geomatrix, dated October 1996. Results of chemical analysis of the soil samples collected during this investigation that are representative of the quality of soil that may be encountered during the construction of the ballpark are discussed on pp. III.156 - III.157. Groundwater quality based on the results of this investigation is discussed in III.J. Water Quality and Aquatic Ecology, pp. III.176 - III.178. The results of the risk evaluation and a discussion of compliance with the Maher Ordinance are presented in IV.I. Contamination and Environmental Risk, pp. IV.297 - IV.300.

Soil Quality

Soil samples collected and analyzed during the site investigation indicate the presence of volatile organic compounds (VOCs), polynuclear aromatics (PNAs), pesticides, metals and other inorganic compounds in the site soil.[9] The primary chemicals[10] detected in soil were PNAs and some metals. These chemicals may be encountered up to 8 ft. below grade across the site and up to 14 ft. below grade in the proposed batting cage areas during construction of the ballpark. The distribution of the PNAs appears variable and fairly widespread across the site, suggesting that the PNAs are related to the fill or waste products from the former coal gasification plant.

Antimony, arsenic, copper, lead and mercury were detected most frequently at various depths and locations across the site. Concentrations of these metals did not appear to be associated with a specific source, suggesting that they are associated with the fill. Other metals[11] were not detected or were found at low concentrations.

Coal-tar was found in soil samples collected primarily north of Berry Street below a depth of approximately 10 ft. below ground surface (bgs). Deep soil north of Berry Street (near well point WP-06, as shown in Figure X.F.3, Appendix F, Contamination and Environmental Risk, p. A.162) contained elevated concentrations of BTEX and phenolic compounds that appear related to coal gasification waste. BTEX and other coal-tar related compounds detected in the soil samples appear to be bound to the coal tar in the soil, limiting the extent and potential for future migration. Because the coal tar has likely been in place for over 100 years, the observed limited distribution of chemicals indicates low migration rates and stable conditions that are not likely to change unless the coal tar is removed and residual concentrations of BTEX or phenols remain.[12]

Pesticides (dieldrin) and other inorganic compounds, including fluoride, ammonia, total sulfide, and asbestos, were also detected in soil that may be encountered during ballpark construction. These chemicals were not present at concentrations that may be of toxicological concern.[13]

The results of the site investigation indicate that the presence of USTs has not affected the soil that may be encountered during ballpark construction. While documentation of removal of several USTs used in the past at the project site could not be located, soil tests suggest that they have not leaked.

Risks to Aquatic Life

Chemicals dissolved in the shallow groundwater at the ballpark site may migrate to the China Basin Channel and subsequently to the San Francisco Bay (see III.J. Water Quality and Aquatic Ecology, pp. III.176 - III.178, for a discussion of groundwater quality and groundwater flow directions). Geomatrix conducted an ecological risk assessment that evaluated the potential effects of migrating groundwater contaminants from the project site on aquatic life in the Channel and the Bay. The migration of groundwater contaminants to the Channel and the Bay is not caused by the project, nor would the project be expected to cause an increase in migration.

Six chemicals of potential ecological concern, including copper, mercury, nickel, silver, total cyanide and total ammonia, were identified in the shallow groundwater at the ballpark site. Mean concentrations of these chemicals in groundwater were compared to ambient water quality criteria developed by the U.S. EPA, water quality objectives developed by the RWQCB and literature-based toxicity response values.[14]

The mean concentration of each of the chemicals of potential ecological concern are within a factor of three and no more than a factor of ten (i.e. in the case of mercury) of the applicable chronic ambient water quality criteria[15]. This comparison does not consider dilution of groundwater from the project site as it enters the Channel. The mean concentration of chemicals detected in the groundwater at the project site was directly compared with the ambient water quality criteria. In addition, these criteria were developed for evaluating effluent discharges to ambient water where time-sequenced sampling[16] is practical. A direct comparison of mean groundwater concentrations to criteria developed as average chemical

concentrations of time-sequenced sampling adds to the conservative nature of the approach used. Exceedance of the ambient water quality criteria by a factor of 10 or less, therefore, is not indicative of risk to aquatic organisms.

In addition, with the exception of copper, the majority of the individual sample results for these chemicals were below the applicable ambient water quality criteria. For three chemicals, including mercury, nickel and total cyanide, the individual sample results (mean concentrations for other chemicals were acceptable as discussed above) from the sampling locations along the Channel waterfront, the closest point to the potential point of exposure, were less than the applicable ambient water quality criteria.

Further, based on the site investigation results, the project site has not been identified as a source for the chemicals of potential ecological concern. Concentrations of those chemicals in the groundwater are regionally high due to historical filling and other past activities. Therefore, quantification of risk to the aquatic life in the Channel or the Bay due to the project site is difficult.[17] Regardless of the project site's contribution to existing concentration, the project itself would not change groundwater migration or contaminant levels in the Channel or the Bay.

Site Conditions for Access Driveway

The access driveway proposed off the Second Street right-of-way (see Figure II.D.2 on p. II.10) is part of the San Francisco Redevelopment Agency's (SFRA) South Beach Park site, proposed by the SFRA for redevelopment into an extension of South Beach Park, including additional parking for South Beach Harbor. Contamination issues for the driveway were examined by the SFRA as part of its Phase II site assessment of the South Beach Park site. The Phase II site assessment found that heavy metals, such as lead, polynuclear aromatics (PNAs) and petroleum hydrocarbons were present in subsurface soils above levels of detection.[18]

Based on the results of the Phase II site assessment, a health risk assessment and a *Site Mitigation Report* were prepared to comply with the City's Maher Ordinance requirements.[19] The health risk assessment indicated that cancer and non-cancer risks were present at levels greater than the accepted cancer and non-cancer threshold risk levels for all potentially exposed groups considered in the risk analysis. Recommended measures for site mitigation include following procedures in the *Health and Safety Plan* developed for construction of South Beach Park, using imported fill for landscaped areas, installation of a clay cap, and following utility maintenance guidelines developed in the *Site Mitigation Report*. The *Health and Safety Plan* includes procedures for minimizing exposure such as donning personnel protective equipment, implementing dust control measures, and proper management of disturbed and/or excavated soil. The utility maintenance guidelines outline the nature of soil contamination, notification procedure or health and safety responsibilities, and soil management requirements to ensure that maintenance workers are not exposed to in-place contaminants. Any construction proposed in the South Beach Park site would have to comply with the requirements of the *Site Mitigation Report*. Therefore, the project sponsor would implement the procedures in the *Site Mitigation Report* for construction work conducted for the service access driveway. Since preparation of the *Site Mitigation Report*, the SFRA has conducted additional Phase I and Phase II site assessments.[20] These recent assessments corroborate the 1993 *Site Mitigation Report*.

Glossary

Toxic Substances: may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability, or death. For example, such substances can cause disorientation, acute allergic reactions, asphyxiation, skin irritation, or other adverse health effects if human exposure exceeds certain levels. (The level depends on the substance involved.) Carcinogens (substances known to cause cancer) are a special class of toxic substances. Examples of toxic substances include benzene, which is a component of gasoline and a suspected carcinogen, and methylene chloride, a common laboratory solvent.

Ignitable Substances: are hazardous because of their ability to burn. Gasoline, hexane, and natural gas are examples of ignitable substances.

Corrosive Materials: can cause severe burns or damage materials; these include strong acids and bases such as sodium hydroxide (lye) or sulfuric acid (battery acid).

Reactive Materials: may cause explosions or generate toxic gases. Explosives, pure sodium or potassium metals (which react violently with water), and cyanides are examples of reactive materials.

NOTES - Contamination and Environmental Risk

1. Geomatrix Consultants; Inc., *Work Plan for Investigation of the Giants Pacific Bell Park Site*, San Francisco, California, May 1996.*

2. Previous environmental investigations include the following:

   a) Dames & Moore, *Draft Report Preliminary Hazardous Waste Investigation, Embarcadero Roadway Project, San Francisco, California*, prepared for Bechtel Environmental, Inc., October 12, 1990.

   b) Geo/Resource Consultants, Inc., *Preliminary Site Characterization Report, King Street Properties Investigation, San Francisco, California*, prepared for City and County of San Francisco, Department of Public Works, January 1991.

   c) Harding Lawson Associates, *Removal of Underground Tanks, Pier 46, San Francisco, California*, September 21, 1987.

   d) Morrison Knudsen Corporation, *Final Report Preliminary Site Investigation, Director's Deed DD-38276-01-02, Berry Street Property, San Francisco, California*, prepared for California Department of Transportation, October 23, 1992.

   e) Woodward-Clyde Consultants, *Phase I Environmental Site Assessment Property Located at 35-65 Berry Street, San Francisco, California*, prepared for Levi Strauss & Co., July 14, 1995.

3. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California, Volume 1*, October 1996.*

4. Morrison Knudsen Corporation, *Final Report Preliminary Site Investigation, Director's Deed DD-38276-01-02, Berry Street Property, San Francisco, California*, prepared for California Department of Transportation, October 23, 1992.

5. Non-friable materials are those which cannot be easily crumbled.

6. Woodward-Clyde Consultants, *Phase I Environmental Site Assessment Property Located at 35-65 Berry Street, San Francisco, California*, prepared for Levi Strauss & Co., July 14, 1995.

7. Morrison Knudsen Corporation, *Final Report Preliminary Site Investigation, Director's Deed DD-38276-01-02, Berry Street Property, San Francisco, California*, prepared for California Department of Transportation, October 23, 1992.

8. Fire insurance maps are produced for private fire insurance map companies to show buildings in sufficient detail for insurance underwriters to evaluate risks and establish premiums. These maps indicate uses of properties at specified dates.

9. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California, Volume 1*, October 1996.*

10. All chemicals detected in the site samples were not present at concentrations that may be of toxicological concern.

11. Remaining metals, including barium, beryllium, cadmium, chromium, cobalt, molybdenum, nickel, vanadium and zinc, were analyzed to meet the requirements of Title 17 California Code of Regulations and Article 20 - Ordinance Number 253-86 of the City and County of San Francisco (Maher Ordinance).

12. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California, Volume 1*, October 1996.*

13. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California, Volume 1*, October 1996.*

14. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California, Volume 1*, October 1996.*

15. Four-day average of chemical concentrations in ambient water that is protective of marine organisms.

16. Time-sequenced sampling allows collecting data over a period of time in situations where concentrations are expected to change with time; data presented is an average of chemical concentrations over that period of time.

17. Ravi Anulanantham, Toxicologist, San Francisco Bay Regional Water Quality Control Board, personal conversations, January 30, 1997.

18. Baseline Environmental Consulting, *Report on Phase II Site Assessment, South Beach Park Project, San Francisco, California*, prepared for San Francisco Redevelopment Agency, July 1992. *A copy of this report is on file for public review at the San Francisco Department of Public Health, Bureau of Environmental Health Management, 101 Grove Street, San Francisco.*

19. Baseline Environmental Consulting, *Health and Safety Plan, South Beach Park Project, San Francisco, California*, prepared for San Francisco Redevelopment Agency, July 1993. *A copy of this report is on file for public review at the San Francisco Department of Public Health, Bureau of Environmental Health Management, 101 Grove Street, San Francisco.*

    Baseline Environmental Consulting, *Site Mitigation Report, South Beach Park Project, San Francisco, California*, prepared for San Francisco Redevelopment Agency, July 1993. *A copy of this report is on file for public review at the San Francisco Department of Public Health, Bureau of Environmental Health Management, 101 Grove Street, San Francisco.*

20. Treadwell & Rollo, Inc./Olivia Chen Consultants, *Phase I Environmental Site Assessment, South Beach Parking Structure and Maritime-Use Building, San Francisco, California*, prepared for San Francisco Redevelopment Agency, October 30, 1996. *A copy of this report is on file for public review at the San Francisco Department of Public Health, Bureau of Environmental Health Management, 101 Grove Street, San Francisco.*

Treadwell & Rollo, Inc./Olivia Chen Consultants, *Environmental Site Characterization, South Beach Parking Structure and Maritime-Use Building, San Francisco, California*, prepared for San Francisco Redevelopment Agency, January 31, 1997. *A copy of this report is on file for public review at the San Francisco Department of Public Health, Bureau of Environmental Health Management, 101 Grove Street, San Francisco.*

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

J. WATER QUALITY AND AQUATIC ECOLOGY

REGULATORY BACKGROUND

San Francisco Bay Basin Water Quality Control Plan (Basin Plan)

The San Francisco Bay Regional Water Quality Control Board (RWQCB) regulates surface water and groundwater quality in San Francisco Bay through its *San Francisco Bay Basin Water Quality Control Plan* (Basin Plan).[1] The Basin Plan is the master policy document describing the legal, technical, and programmatic bases of water quality regulation in the San Francisco Bay region. The Basin Plan fulfills the requirements of both the Porter-Cologne Act which calls for water quality control plans in California, and the federal Clean Water Act. The plan identifies the beneficial water uses of surface waters (e.g., lakes, creeks, San Francisco Bay, etc.) and groundwater, the water quality objectives needed to protect those beneficial uses, and the strategies and schedules for achieving those objectives (see Appendix G, Water Quality and Aquatic Ecology, pp. A.165 - A.166).

Basin Plan Policies for Groundwater Quality

Surface water quality is regulated by controlling the quality of discharges into waters so that water quality objectives are met. In contrast, groundwater is regulated when groundwater quality objectives are not being met, where clean-up is required and/or under way, or where no further waste discharges will be allowed. The RWQCB directs several programs that regulate potential pollution sources, clean up polluted sites, and protect groundwater. Other hazardous waste laws and regulations for protection of groundwater from contamination by hazardous materials leaching through contaminated soils into groundwater are discussed in III.I. Contamination and Environmental Risk, pp. III.149 - III.153.

Storm Water Pollution Prevention

Under RWQCB requirements, non-point storm water runoff from construction sites and industrial areas is regulated under a general storm water permit. As discussed below, the City and County of San Francisco operates a combined sewer system that conveys sanitary wastewater and storm water in the same set of pipes. This combined flow receives treatment at the City's wastewater treatment plants, which discharge under individual National Pollutant Discharge Elimination System[2] (NPDES) permits. Therefore, general permits for storm water discharges in the City usually are not necessary. However, storm drains for some piers, including Pier 46B, and some portions of the Bay shore are not connected to the City's sewer system and instead drain directly to the Bay. Storm water discharges from construction and industrial activities in those areas must be covered by a storm water permit, if such activities are proposed there. The General Industrial Activities Storm Water Permit and the General Construction Activity Storm Water Permit require the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP). An SWPPP describes site controls for construction sites and industrial facilities that prevent pollutants from entering storm water.

SAN FRANCISCO WASTEWATER TREATMENT SYSTEM

The City is divided into two major hydrologic drainage basins. Each basin captures wastewater and storm water by gravity and directs the flow to a wastewater treatment plant in that basin. The Westside basin drains toward the ocean to the Oceanside Water Pollution Control Plant, which is in the southwest quadrant of the City adjacent to Lake Merced. The southeast portion of the Bayside drainage basin drains the east side of the City, including the site, and directs flow towards the Bay to the Southeast Water Pollution Control Plant located near Islais Creek Channel. The North Point Water Pollution Control Plant on Bay Street treats wastewater and storm water from the northeast portion of the Bayside drainage basin but operates only during wet weather.

Wet Weather Overflows

Depending on the duration and intensity of storms, the volume of storm water runoff draining into the Southeast Plant sometimes exceeds the storage capacity of the transport/storage facilities and the treatment capacity of the Southeast and North Point Plants. When this occurs, the excess flow discharges through a number of outfalls along the City's shoreline into San Francisco Bay. The volume of overflows discharged during the 1995 to 1996 rainy season from all overflow points on the San Francisco Bay and Pacific Ocean shoreline totaled 1,176 million gallons. Data on volumes released from individual overflow points are not maintained by the City because flow rates are not measured there. Several overflow structures discharge into China Basin Channel. The one closest to the ballpark site is off Berry Street at the Lefty O'Doul Bridge. According to City staff, the majority of overflows into China Basin Channel during the most recent year of record (1995-1996) were released from the Sixth Street/Berry Street outfall at the western end of China Basin Channel.[3]

Overflows are partially treated during storage in the wastewater system's transport/storage facilities, which are long box-like structures. Barriers in the transport/storage boxes physically remove material floating on the surface of the combined sewage. Some settling of suspended particulates also occurs during storage. No other filtering or chemical treatment is provided to wastewater overflows. Because these overflows occur only during wet weather, the raw sewage is diluted as much as 10:1 by rainwater. The number of overflows allowed per year along the bayside of the City is regulated by the NPDES permit for the Southeast Plant. The overflow outfalls into China Basin Channel are in an area of the San Francisco shoreline where each outfall is permitted an average of up to ten overflows per year. Combined sewer overflows into China Basin Channel occurred three times from one of those overflow structures at Sixth Street/Berry Street during the most recent year of record (1995-96 water year).

CHINA BASIN CHANNEL

The project site is adjacent to San Francisco Bay and China Basin Channel (also known as Mission Creek) in the northern part of the City's Mission Bay area. Mission Bay was an extensive shallow bay before it was gradually filled beginning in 1865. Fresh water drained into Mission Bay from springs on Rincon Hill that flowed into Mission Creek. China Basin Channel is the last remnant of Mission Creek and Mission Bay.

China Basin Channel is a dead-end inlet of San Francisco Bay. The primary uses of China Basin Channel are: 1) as a waterway for private and commercial boat traffic; 2) as the site of berths for approximately 20 houseboats and 25 pleasure craft; and 3) as the receiving water for overflows from the City and County of San Francisco's combined sewer system. China Basin Channel is maintained at a navigable depth of about 20 feet (ft.) to allow passage of houseboats, pleasure craft, and other activities related to the Port of San Francisco at Pier 46B. The Channel is about 4,600 ft. long, 150 ft. wide through most of its length, and about 430 ft. wide at its outlet to the San Francisco Bay at China Basin.[4]

Water Quality of China Basin Channel

Little water quality data for China Basin Channel are available because no studies have been performed for the Channel. However, it may be assumed that water quality would be reflective of that of the Bay due to good tidal circulation in the Channel. The mean tidal prism (the volume of water moved in and out during a mean tidal cycle) is large compared to the total volume of the Channel, providing good tidal circulation at the east end of the Channel, even though the Channel becomes more shallow at its inland terminus. Another factor promoting water circulation in the Channel is that the Channel joins San Francisco Bay at a location where tidal currents are strong. Tidally induced circulation is reduced during neap tides (tides of lowest range) because tidal flushing is then weakest. Conversely, tidal flushing is most effective during the spring tide period (tides of highest range).[5]

When overflows sometimes occur during wet weather, chemical concentrations in surface waters at the mouth of China Basin Channel reflect the chemical concentrations in the overflow discharge water. Under such conditions, water quality at the mouth of China Basin Channel would be degraded because the flushing of sediments from its upper (western) portions would induce the highest concentrations of particle-associated and dissolved chemicals. Sediment quality is further described below.

Sediment Quality of China Basin Channel

The sediment quality of China Basin Channel is degraded due to combined sewer overflow discharges into the western end of China Basin Channel. For many years until the 1970s and early 1980s, completely untreated overflows of combined sewage and storm water discharged to China Basin Channel and at other locations around the City over 80 times per year.[6] While the San Francisco Clean Water Program has built major treatment and storage facilities that have reduced the number of overflows to ten or fewer per year, which has improved the quality of those overflows, the quality of sediment in the bottom of China Basin Channel has been affected by many years of untreated sewer overflows.

The RWQCB recently completed surveys of sediment quality in China Basin Channel as part of a Bay-wide survey of sediment chemistry and toxicology.[7] Two stations in China Basin Channel were sampled for sediment quality and toxicology: one in the upper (western) portion of China Basin Channel, and one at the mouth in the vicinity of the site of the proposed ballpark. The RWQCB analyzed the sediment from those stations for chemical contaminants and performed toxicity tests on the sediment. The toxicity tests that were applied measured "lethality" (i.e., the survival of amphipods[8]) and the extent to which the sediment influenced the development and growth of sea urchin embryos.

Chemical contaminant concentrations in China Basin Channel sediments from two stations are presented in Table III.J.1. The sediments of China Basin Channel were found to be highly toxic

TABLE III.J.1
TOXICITY SCREENING RESULTS AND CHEMICAL SEDIMENT QUALITY FOR SELECTED CONTAMINANTS IN CHINA BASIN CHANNEL

Parameter Measured	Measurements[1]		Sediment Quality Guidelines[2]	
	Upstream China Basin Channel	Mouth of China Basin Channel	Effects Range Low	Effects Range Median
Sea Urchin toxicity (percent normal development upon exposure)	0	57	NA	NA
Amphipod survival (percent upon exposure)	5	83	NA	NA
Cadmium (μg/g)	0.826	0.513	1.2	9.6
Copper (μg/g)	59.5	57.9	34	270
Lead (μg/g)	254	33	46.7	218
Mercury (μg/g)	0.45	0.24	0.15	0.71
Zinc (μg/g)	317	145	150	410
Total DDT (ng/g)	6.5	3.6	1.58	46.1
Total PCB (ng/g)	135	38	22.7	180
Total PAH (ng/g)	2,426	4,971	4,022	44,790

Notes:
μg/g = micrograms per gram (1×10^{-6} grams per gram)
ng/g = nanograms per gram (1×10^{-9} grams per gram)
PCB = polychlorinated biphenyls
PAH = polynuclear aromatic hydrocarbons

1. Karen Taberski, Staff Biologist, Regional Water Quality Control Board, San Francisco Bay Region, personal communication, August 14, 1996.
2. Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder, "Incidence of adverse biological effects within the ranges of chemical concentrations in marine and estuarine sediments." *Environmental Management*, 19:81-97, 1995. The Effects Range Low (ERL) is the concentration at which 10% of the test population may be expected to show effects. The Effects Range Median (ERM) is the concentration at which 50% of the test population may be expected to show effects. No sediment quality standards exist. However, the ERL and ERM values are widely used as guidelines to evaluate whether sediment at a particular site might have toxic effects based on chemical concentrations.
3. Data from one set of samples taken in the western end of China Basin Channel. A second set of samples was analyzed for some constituents and yielded similar numerical results.

to marine test organisms. For the most part the data show that sediment quality at upstream (western) stations is substantially more degraded than at the mouth of China Basin Channel. Concentrations of toxic chemicals in China Basin Channel sediments, such as heavy metals, pesticides, and petroleum compounds, while high, were found unlikely to be the cause of the observed toxicity. The survey concluded that the most likely cause of the toxicity is high concentrations of ammonia and sulfides in the sediments resulting from the high concentrations of organic materials discharged to the Channel in overflows.

Aquatic Habitats of China Basin Channel

The aquatic habitats of China Basin Channel are primarily limited to sub-tidal waters. With the exception of a narrow fringe of pickleweed and other salt-marsh plants, there is no wetland habitat associated with China Basin Channel. The length of the entire Channel is retained by rip-rap and retaining walls that discourage the formation of wetlands, although rip-rap areas may serve as the substrate for some attached algae and attached estuarine animals. The water in the Channel contains floating and sunken debris which pose choking hazards to larger aquatic organisms and impair feeding habitat for bottom-foraging organisms.

Biota of China Basin Channel

No recent surveys of the biota have been performed for the Channel. Past studies of the benthic community and fish population of upper China Basin Channel indicated reduced numbers and species, with a predominance of mollusks and polychaetes indicating stress from pollution. Surveys of similar areas throughout San Francisco Bay are consistent with these data. The biota in the mouth of the Channel include moderate-to-dense populations of pollution-tolerant species such as the amphipod *Ampelisca,* marine worms, and a variety of

small clams and snails. The fish community at the mouth of the Channel is likely to contain a more diverse and abundant fish community, more representative of the Bay itself.

Although no extensive data collection has been conducted for fishes in China Basin Channel, observations of wading birds (such as the common egret) and diving birds (such as the double-crested cormorant) in the vicinity of the mouth of the Channel (from the eastern end of Pier 46B to slightly west of the Lefty O'Doul Bridge) suggest the presence of fish in the waters at the mouth of China Basin Channel.[9] Small numbers of fish occur at least intermittently in the upper portions of the Channel. California sea lions (*Zalophus californianus*) and harbor seals (*Phoca vitulina*) are known to be regular visitors to the mouth of China Basin Channel, which is another indication that fish are present there.

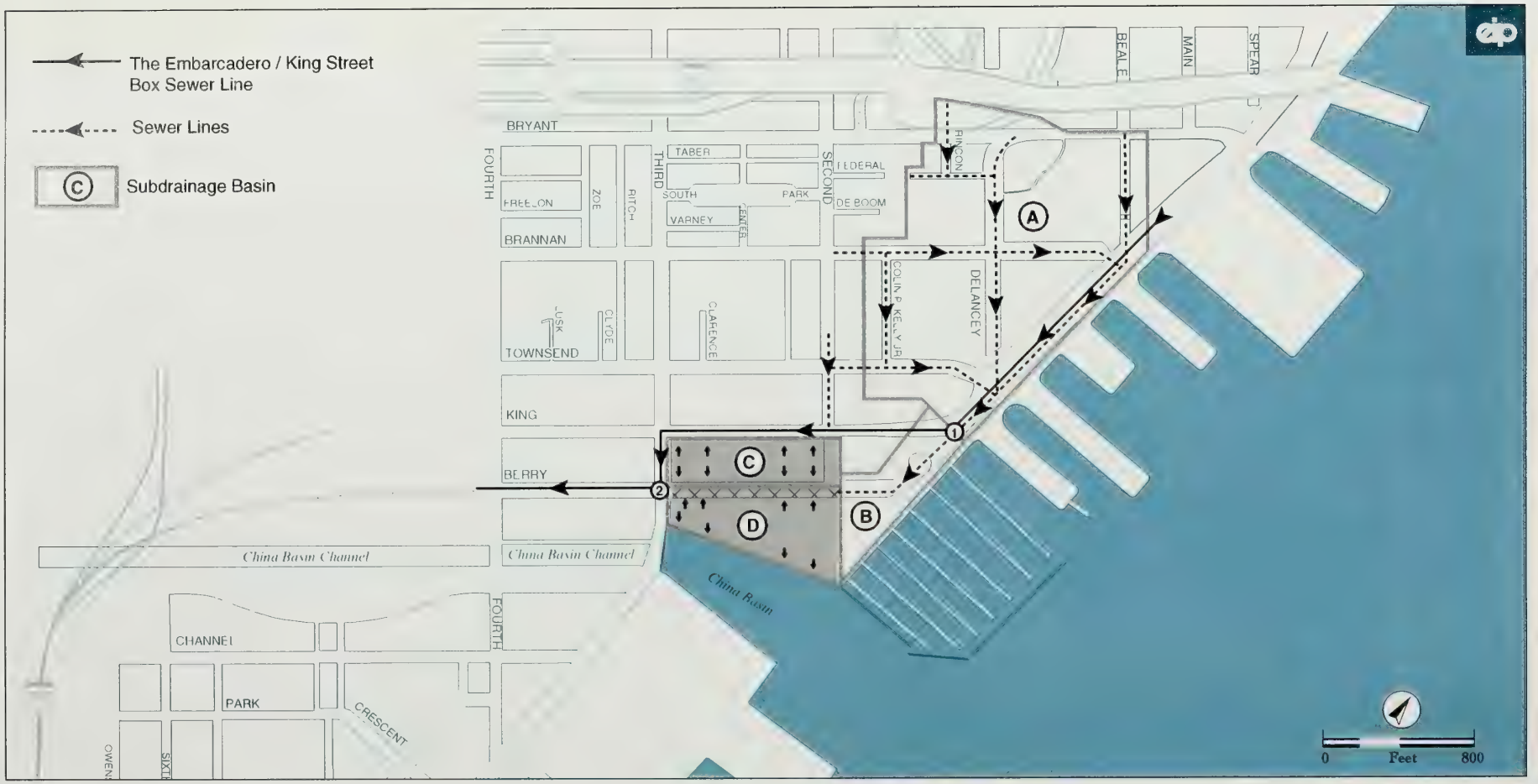
Pacific herring spawn along the San Francisco waterfront from the Golden Gate to Hunters Point, including the area at the mouth of China Basin Channel.[10] The spawning season is generally from November 1 to March 30 of each year, peaking between December 1 and March 1.[11] The major habitat requirements for the spawning of Pacific herring include surfaces to which eggs can become attached, a requirement fulfilled variously by rip-rap, retaining walls, bulkheads, and attached kelp in areas in San Francisco Bay as diverse as Raccoon Strait, Angel Island, Richardson Bay, the Oakland Estuary, and the Bayside waterfront of the City and County of San Francisco. Because of the commercial importance of the roe (fish eggs), which are harvested and exported to Japan, the California Department of Fish and Game regularly monitors the fish.

Rare, threatened, protected, and endangered species that occur in China Basin Channel include California sea lions and harbor seals, which are protected under the Marine Mammal Protection Act (see Appendix A, Initial Study, pp. A.29 - A.31). California brown pelicans (*Pelecanus occidentalis*) also occur in the project area and are listed as endangered under the Federal Endangered Species Act. The area does not provide critical or breeding habitat for pelicans, however. Foraging and resting habitat for pelicans, such as that in the project site, is common and widespread throughout the Bay.

Other rare, protected, or endangered species that occur in San Francisco Bay include the American white pelican (*Pelecanus erythrorhynchos*), a California Department of Fish and Game species of special concern; winter-run Chinook salmon (*Onchorhynchus tshawytscha*), a federally and state-listed endangered species; tidewater goby (*Eucyclogobius newberryi*), a federally endangered and state species of concern; green sturgeon (*Acipenser medirostris*), federally recommended as endangered; longfin smelt (*Spirinichus thalechthys*), a state species of concern; and delta smelt (*Hypomesus transpacificus*), a federally and state-listed threatened species. No observations in China Basin Channel of these species have been recorded.[12] White pelicans do not generally feed in urban areas like China Basin Channel, and neither winter-run chinook salmon nor delta smelt have been recorded in waters south of the Bay Bridge. The terrestrial flora and fauna found adjacent to China Basin Channel are described in Appendix A, Initial Study, pp. A.28 - A.31.

SITE DRAINAGE

The project site is flat with elevations ranging from approximately 10 to 13 ft. above mean lower low water.[13] Sewers of various size along Berry, King, Second, and Third Streets convey sanitary wastewater and storm water to the Southeast Water Pollution Control Plant for treatment. One of the two sewers along Berry Street has a diameter of 12 inches. This sewer collects sanitary flows from buildings between Second Street and Third Street. A second sewer along Berry Street is 2 feet 6 inches wide by 3 feet 9 inches deep. It has a flat top and an egg-shaped bottom section that is brick-lined. As shown on Figure III.J.1, the sewer conveys sanitary sewage and storm drainage from an off-site area north of The Embarcadero and Townsend Street (Area A) to a junction structure at Third and Berry Streets, and continues west down Berry Street to the Channel Street Pump Station at point 2 Seventh Street. The Berry Street sewer also collects drainage from Area B, which includes a portion of South Beach Park, South Beach Harbor, and the Port properties at the east end of Berry Street. During peak storm events, excess flow from the Berry Street sewer overflows through the junction box at Third and Berry Streets where it joins a 3-ft.-by-5-ft. brick sewer. Excess flow discharges through the nearest overflow structure there at Third Street into China Basin Channel.



SOURCE: Olivia Chen Consultants, 1997

GIANTS BALLPARK

● **Figure III.J.1 Wastewater Flow Pattern Before Sewer Re-Route**

- The majority of Area A wastewater is produced by the multi-family residential developments in this area, which include the Bayside Village Apartments, Delancey Street Foundation, South Beach Marina Apartments, and the Steamboat Point Apartments. During periods of heavy storms, sewer back-ups have regularly occurred at the Delancey Street Foundation buildings. The City has agreed and is actively working with Delancy Street and other property owners with sewer backup problems to identify further solutions.

- The San Francisco Redevelopment Agency's (SFRA) planned South Beach Park project is adjacent to the ballpark site. If any excavation is involved as part of the South Beach Park project, the SFRA may re-route the upstream portions of the Berry Street sewer. Flows from Area A upstream of King Street and The Embarcadero will be diverted to The Embarcadero/King Street box sewer instead of continuing down the Berry Street sewer. The Embarcadero/King Street box sewer is a high-capacity 17.5-ft.-wide box sewer that is over 30 ft. deep at the intersection of The Embarcadero and King Street. If this work is not completed by the SFRA as part of its proposed project, it would be done as part of the ballpark project.

- The southern part of Area C and the northern part of Area D presently drains into the Berry Street sewer. The northern part of Area C drains north to the Embarcadero/King box sewer, and the southern 1/3 portion of Area D drains directly to the mouth of the Channel through two storm drains just east of the Pier 46B building.[14] The Pier 46B building also contains interior floor drains that have been closed for a few years. Before they were closed, the floor drains drained into a central pipe in the middle of the building. This pipe discharged to the Channel through an outfall located on the bulkhead below mean lower low water. Storm water on the existing walkway deck drains directly to the Channel through small drain pipes in the deck.

The area south of the Channel proposed for dedicated ballpark parking is not in an area that is fully sewered.[15] The main sewers in that area extend along Channel Street and south down Fourth Street and Third Street. Parts of the South-of-Channel parking area probably currently drain into those sewers, but most rainwater falling on that area ponds on the surface due to its levelness, then either evaporates or infiltrates into the soil.[16] One area that

may directly drain into the Channel is the triangular-shaped parking area (see Figure II.D.5, p. II.20). The edge that adjoins the Channel may contribute storm water to the Channel.

The Port leases much of its property to tenants involved in industrial activities. The State Water Board requires specific industrial activities to obtain a General Industrial Activity Storm Water Permit and prepare and implement SWPPPs. Many Port tenants are subject to this requirement, including the Port-operated Maintenance Operations Facility at the Pier 46B building. The Port of San Francisco manages a group monitoring program that includes both Port-operated and tenant-operated facilities to address the monitoring requirements for both the Port's industrial activities and tenant industrial activities.[17] Tenant participation in the program is voluntary.

Some potential constituents that might be found in storm water from the Pier 46B facility include paint chips from a paint shop, oil and grease from vehicle servicing, and heavy metals that may originate from used engine oil. Monitoring results from the most recent monitoring year (1995-1996) indicate that there generally is no observable evidence of pollution in storm water discharging to the Channel, other than oily sheen on the surface of run-off from the pier deck.[18]

GROUNDWATER HYDROLOGY

The ballpark site is in the Downtown groundwater basin. The Downtown groundwater basin is open to San Francisco Bay to the east side and includes the Mission Creek and North Beach districts. It is separated from the Marina Basin by a bedrock ridge that extends southwest through Russian Hill and Pacific Heights. The ridge continues south to Twin Peaks, separating the Downtown Basin from other groundwater basins to the west.[19] No use of groundwater actually occurs on the east side of the City, including the ballpark site, and future development of groundwater as a source of drinking water has been determined by the RWQCB to be unlikely due to poor groundwater quality in that area.[20]

Groundwater is defined as subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated. Shallow groundwater occurs under unconfined

conditions on the ballpark site between depths of approximately 7 and 12 ft. below the ground surface. As discussed below, the direction of groundwater flow on the site is generally towards the center of the site. Data collected for the site investigation and risk assessment performed by Geomatrix for the project indicate that groundwater drains into the 2-foot-6-inch by 3-foot-9-inch sewer along Berry Street, which is mostly below groundwater. However, groundwater does not drain into the sewer at Second Street. Fluids in the sewer line flow by gravity to the west toward Third Street.[21]

Influence of Tides on Groundwater Movement

Due to the location of the site adjacent to San Francisco Bay and China Basin Channel, the groundwater underneath the site is subject to tidal influence. Results of a tidal influence study suggest that the presence of the underground sewer along Berry Street is limiting the extent of tidal influence at the site.[22] The portion of the site south of Berry Street appears heavily influenced by tides with measured water level changes of up to 3 ft. within a tidal cycle (i.e., between the elevations of the highest tide and the lowest tide). Tidal influence is also indicated by the presence of elevated concentrations of total dissolved solids measured in groundwater samples. Tidal fluctuations of up to 4 ft. are noted near Second and Berry Streets at the eastern end of the ballpark site. In contrast, the area north of Berry Street and north of the sewer line appears to have little or no tidal influence.

GROUNDWATER QUALITY

Data From Previous Studies

As described in III.I. Contamination and Environmental Risk, p. III.155, previous soil and groundwater investigations have been conducted on portions of the project site. Geomatrix used the results of the data collected during those investigations to supplement its site investigation report and risk evaluation. Previous groundwater investigations installed and used three groundwater monitoring wells in the northern half of the ballpark site. Those

investigations found that total petroleum hydrocarbon (TPH) as gasoline, TPH as motor oil, and BTEX generally were present. (For ease of reference, benzene, toluene, ethylbenzene, and total xylenes are referred to as BTEX in this EIR.) The investigations also detected elevated levels of polynuclear aromatics (PNA) and phenols. With the exception of barium, no other metals were detected. The investigations detected cyanide and concur generally that it may be associated with a former coal gasification facility north of the project site and on the eastern portion of the site. One of the monitoring wells is adjacent to a former underground storage tank (UST) with unknown fuel constituents. Samples from this well showed trace concentrations of BTEX and low concentrations of TPH as gasoline and TPH as motor oil, suggesting that the presence of the UST did not significantly affect groundwater quality.

Data from 1996 Study

As described in III.I. Contamination and Environmental Risk, p. III.155, Geomatrix Consultants, Inc. performed a site investigation and risk evaluation that included soil and groundwater characterization and a risk assessment for project exposure to existing contamination. Soil contamination on the site is discussed in III.I. Contamination and Environmental Risk, pp. III.160 - III.161, and the risk evaluation is presented in IV.I. Contamination and Environmental Risk, p. IV.288 - IV.297.

The shallow groundwater survey performed on the site included the installation and sampling of 18 temporary well points (see Appendix F, Contamination and Environmental Risk, Figure X.F.3, p. A.162 for locations). Geomatrix used grab groundwater sampling using Hydropunch™[23] methods in a second round of sampling to better define groundwater conditions in one part of the site in which elevated concentrations of chemicals were detected in groundwater. Geomatrix also used Hydropunch™ methods to collect groundwater samples in reported or former UST locations at which existing soil or groundwater data were

available. Analysis of those samples by Geomatrix indicates that groundwater was not affected by the USTs.

The results of the shallow groundwater survey found that the site generally contains low to non-detectable levels of volatile organic compounds. However, benzene, toluene, ethylbenzene, total xylenes, and phenolic compounds occur at elevated concentrations in groundwater from one sampling location at well point WP-06, which is in the northern portion of the site near King Street (see Appendix F, Contamination and Environmental Risk, Figure X.F.3, p. A.162 for its location). The extent of BTEX and phenolic compounds in groundwater appears limited to the immediate vicinity of well point WP-06.

As discussed in III.I. Contamination and Environmental Risk, p. III.160, BTEX and the phenolic compounds appear related to coal gasification waste. The organics in the coal tar appear to be binding the chemicals to the soil, thus limiting their migration in groundwater. Because the coal tar has likely been in place for 100 years or more, the observed limited distribution of chemicals indicates very low migration rates and stable conditions that are not likely to change unless the organics in the soil (i.e., the coal tar) are removed and residual concentrations of BTEX or phenols remain. Groundwater samples taken near the submerged sewer beneath Berry Street do not show significant concentrations of BTEX or other coal tar-related compounds, which indicates that the sewer is not acting as a conduit for the chemical-containing groundwater to migrate off-site.

Groundwater samples taken from other locations show low concentrations of PNAs. Groundwater samples were also analyzed for phenols, metals, and cyanide, but the average of the concentrations detected is acceptable, below the applicable U.S. Environmental Protection Agency acute and chronic ambient water quality criteria and RWQCB water quality objectives. The RWQCB approved the site investigation report and risk evaluation performed by Geomatrix and does not require soil or groundwater remediation, but would require monitoring at well point WP-06 during dewatering (see IV.J. Water Quality and Aquatic Ecology, p. IV.322).[24]

NOTES - Water Quality and Aquatic Ecology

1. San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Basin (Region 2), *Water Quality Control Plan*, June 21, 1995.

2. Point source discharges to surface waters generally are controlled through waste discharge requirements issued under federal National Pollutant Discharge Elimination System (NPDES) permits. A point source usually refers to waste emanating from a single, identifiable location, while a non-point source usually refers to waste emanating from diffuse locations. Storm water is considered to be a non-point source. Although the NPDES program was established by the federal Clean Water Act, the permits are prepared and enforced by the Regional Boards through California's delegated authority for the act. Issued in five-year terms, an NPDES permit usually contains components such as discharge prohibitions, effluent limitations, and necessary specifications and provisions to ensure proper treatment, storage, and disposal of the waste. The permit often contains a monitoring program that establishes monitoring stations at effluent outfalls and receiving waters. For point source discharges, NPDES permits are individually issued. For example, the Southeast Water Pollution Control Plant in San Francisco has an individual NPDES permit, which controls the quality of treated sanitary flow and storm water discharged from the treatment plant.

3. James Salerno, Laboratory Manager, Bureau of Water Pollution Control, Department of Public Works, City and County of San Francisco, personal communication, August 16, 1996.

4. City and County of San Francisco, Planning Department, *Port of San Francisco Waterfront Land Use Plan, Draft Environmental Impact Report*, SCH No. 94123007, May 24, 1996, p. 272.*

5. City and County of San Francisco, Department of City Planning, *Mission Bay Final Environmental Impact Report*, SCH No. 86070113, Volume Two, Technical Analyses, August 23, 1990, p. VI.L.6.*

6. City and County of San Francisco, Department of City Planning, *Bayside Discharge Alternatives, Draft Environmental Impact Report*, SCH No. 93023040, May 20, 1994.*

7. Karen Taberski, Staff Biologist, San Francisco Bay Regional Water Quality Control Board, telephone conversation, August 14, 1996.

8. Amphipods are small, shrimp-like animals and are commonly used for standard testing.

9. Joseph O'Connor, Ph.D., observations made on August 19, 1996.

10. Diana Watters, Project Leader for Pacific Herring Research Project, California Department of Fish and Game, telephone conversation, January 31, 1997.

11. Robert Tasto, Environmental Specialist Supervisor, California Department of Fish and Game, telephone conversation, February 4, 1997.

12. California Department of Fish and Game, Natural Diversity Data Base, February 2, 1997.

13. Mean lower low water (MLLW) is the average height of the lower of the two low tides each day. Similarly, mean higher high water (MHHW) is the average of the two higher daily highs.

14. a) Carol Bach, Environmental Regulatory Specialist, Port of San Francisco, telephone conversation, January 30, 1997.

b) Port of San Francisco, *1995-1996 Annual Report of Stormwater Discharges*, June 18, 1996, Site Map.

15. City and County of San Francisco, Department of City Planning, *Mission Bay Final Environmental Impact Report*, Volume Two, Technical Analyses, SCH No. 86070113, August 23, 1990, Figure VI.D.5, p. VI.D.27.

16. Henry Anderson, Chief of Hydraulics, Bureau of Engineering, Department of Public Works, City and County of San Francisco, telephone conversation, March 7, 1997.

17. Port of San Francisco, *Port of San Francisco and Tenants Group Stormwater Monitoring Plan*, rev. September 30, 1996.

18. Port of San Francisco, *1995-1996 Annual Report of Stormwater Discharges*, June 18, 1996.

19. Philips, S.P., Hamlin, S.N., and Yates, E.B., Geohydrology, water quality, and estimation of groundwater recharge in San Francisco, CA 1987-1992, U.S. Geological Survey, Water Resources Investigation Report 93-4019, 1993.

20. San Francisco Bay Regional Water Quality Control Board, Groundwater Committee, *San Francisco and Northern San Mateo County Pilot Beneficial Use Designation Project*, Part 1: Draft Staff Report, April 4, 1996.

21. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California*, Volume 1, prepared for China Basin Ballpark Company, LLC, San Francisco, California, October 1996, p. 22.*

22. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California*, Volume 1, prepared for China Basin Ballpark Company, LLC, San Francisco, California, October 1996, pp. 28 - 29.*

23. The Hydropunch method uses a specially designed tool that collects grab groundwater samples from soil boring holes.

24. Letter from Steve Morse, Chief, Toxics Cleanup Division, San Francisco Bay Regional Water Quality Control Board, to John Yee, San Francisco Giants, re: Approval of Site Investigation Report and Risk Evaluation at Giants Pacific Bell Park Site, San Francisco, California, File No. 38S0045, November 25, 1996.

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

IV. ENVIRONMENTAL IMPACTS

A. CONSISTENCY WITH EXISTING PLANS AND POLICIES

Proposition B mandated several changes in the Planning Code and Zoning Maps for the purpose of facilitating construction of a ballpark. Proposition B also directed the San Francisco Board of Supervisors, Planning Commission and other officials to amend the City's General Plan and other codes and ordinances in a manner consistent with Proposition B. In addition, Proposition B directed such officials to "...request and apply for conforming amendments to all applicable state and regional plans and regulations."[1]

The Planning Department identified and published Proposed General Plan Amendments, related to the proposed ballpark on June 20, 1996 at the time the Planning Commission was considering the proposed Redevelopment Plan Amendments as part of its review of the Preliminary Plan proposed by the Redevelopment Agency.

As described in III.A. Consistency with Existing Plans and Policies, the Port of San Francisco also has proposed amendments to the *Commerce and Industry Element*, *Recreation and Open Space Element*, *Northeastern Waterfront Plan* and *Central Waterfront Plan* portions of the *San Francisco General Plan* in order to establish consistency with, and enable the implementation of, the *Waterfront Land Use Plan* (WLUP). Some of the proposed amendments provide updated background information that is noted if it is relevant to the comparison of existing plans and policies with the proposed project.

CITY AND COUNTY OF SAN FRANCISCO

Amendments Proposed by the City as Part of Project

The following discussion provides a comparison of the project to the relevant plans and policies of the General Plan. Major General Plan Amendments proposed by the City are indicated, with proposed deletions as ~~strikeout~~ and added text underlined.

Recreation and Open Space Element

The proposed ballpark would cast shadows on the area to the east which the San Francisco Redevelopment Agency is planning to develop as a park. This would be inconsistent with Objective 2, Policy 3, regarding preservation of sunlight in public open spaces. The following amendment to the fourth paragraph under Policy 3, page I.3.14 is proposed by the City:

PAGE I.3.14

POLICY 3 Preserve sunlight in public open spaces

A number of other open spaces are under the jurisdiction of other public agencies, or are privately owned and therefore not protected by the Charter amendments. These spaces should be given other forms of protection to assure they are not shaded during the hours of their most intensive use. Any new shading should be remedied to the extent feasible by expanding opportunities for public assembly and recreation in indoor and outdoor settings.

The project includes improvements to the waterfront walkway along Pier 46B which does not currently serve pedestrians. The project would include joining the walkway with the existing waterfront promenade along the boat harbor. These improvements would create a more pedestrian-oriented waterfront in the area of the project site and would provide new access to the waterfront. The ballpark design would include some seating areas with a view of the waterfront and restaurant space that is oriented towards the water. The project includes

improvements to the walkway along the southern side of the site, adjacent to China Basin Channel.

The City proposes the following amendment:

SHORELINE

OBJECTIVE 3 PROVIDE CONTINUOUS PUBLIC OPEN SPACE ALONG THE SHORELINE UNLESS PUBLIC ACCESS CLEARLY CONFLICTS WITH MARITIME USES OR OTHER USES REQUIRING A WATERFRONT LOCATION.

Revise the final two sentences of the fourth paragraph of Objective 3, page I.3.25, as follows:

A ~~4.8~~ 2.5 acre shoreline park is proposed at Rincon Point, and a 6.8 acre South Beach ~~public~~ park ~~and small boat harbor are~~ is being developed at the base of Second Street adjacent to South Beach Harbor as part of the Rincon Point-South Beach Redevelopment.

POLICY 1 Assure that new development adjacent to the shoreline capitalizes on its unique waterfront location, considers shoreline land use provisions, improves visual and physical access to the water, and conforms with urban design policies.

Revise the third paragraph of Policy 1, page I.3.25 as follows:

Restricted Land Uses: Office, residential, public assembly and recreational sports facility with associated commercial uses, water-~~related~~ oriented commercial uses such as restaurants, hotels and shops, and non water-related industrial uses are appropriate only in the areas designated in this plan or other components of the ~~Master~~ General Plan. These uses provide limited public benefits and should be restricted to areas which are not needed for priority uses. Parking accessory to these uses should be in structures or otherwise screened from view. Recreation-oriented commercial services should be permitted where appropriate on land adjacent to open space areas.

Urban Design Element

The proposed project includes vacation of portions of Berry and Second Streets. This may be inconsistent with Objective 2, Policy 9, if it was determined that these portions were of public value. The following amendment is proposed by the City:

PAGE I.5.26

OBJECTIVE 2, CONSERVATION

Street Space

POLICY 9 Review proposals for the giving up of street areas in terms of all the public values that streets afford.

Every proposal for the giving up of public rights in street areas, through vacation, sale or lease of air rights, revocable permit or other means, shall be judged with the following criteria as the minimum basis for review:

b.(3) Necessary for a significant public or semi-public use, or public assembly use, where the nature of the use and the development proposed present strong justifications for occupying the street area rather than some other site;

The proposed ballpark would be approximately 130 feet (ft.) in height with lighting structures approximately 175 ft. This would exceed the 40-ft. height limit guideline provided in Objective 3 Map 4, Urban Design Guidelines for Height of New Buildings. The proposed ballpark height may also be inconsistent with Design Guideline D regarding the goal for low buildings along the waterfront. The following amendments are proposed by the City:

PAGE I.5.29

OBJECTIVE 3, MAJOR NEW DEVELOPMENT

FUNDAMENTAL PRINCIPLES FOR MAJOR NEW DEVELOPMENT

These fundamental principles and their illustrations reflect the needs and characteristics with which this Plan is concerned, and describe measurable and critical urban design relationships in major new development.

1. The relationship of a building's size and shape to its visibility in the cityscape, to important natural features and to existing development determines whether it will have a pleasing or a disruptive effect on the image and character of the city.

A. Tall, slender buildings near the crown on a hill emphasize the form of the hill and preserve views.

B. Extremely massive buildings on or near hills can overwhelm the natural land forms, block views, and generally disrupt the character of the city.

C. Low, smaller-scale buildings on the slopes of hills, at their base and in the valleys between complement topographic forms and permit uninterrupted views.

D. Low buildings along the waterfront contribute to the gradual tapering of height from hilltops to water that is characteristic of San Francisco and allows views of the Ocean and the Bay. Larger, taller buildings providing places of public assembly and recreation may be appropriate along the waterfront if they provide unique overviews or vistas that include portions that are publicly accessible during daytime and evenings, and provide maximum feasible access to the shoreline.

E. Larger, taller buildings can blend pleasantly with small-scaled areas if the change in the scale is not excessive and if their form or surface pattern is articulated to reflect the existing scale.

PAGE I.5.34

Map 4, Urban Design Guidelines for Height of Buildings

Replace the "0-40 ft" designation presently placed on the ballpark site with the "89-160 ft" designation. (The corresponding map in the **Land Use Index**, page III.1.29, would also be changed.)

Northeastern Waterfront Area Plan

The overall goals of the *Northeastern Waterfront Area Plan* are to provide for those uses which positively contribute to the waterfront's environmental quality, enhance the economic vitality of the Port and the City, preserve and enhance the unique maritime character of the area, take advantage of the unique economic opportunity provided by San Francisco Bay, provide for the maximum possible visual and physical access to and along the Bay while minimizing the adverse environmental impacts of existing and new activities.[2]

The Plan presently designates the southern portion of the project site for maritime, warehouse and industrial activities. Objective 26, Policy 1 of the *Northeastern Waterfront Area Plan* provides the following with regard to Pier 46B:

> Retain the Pier 46B area for a Port Maintenance facility and other maritime uses. If no longer needed by the Port for maritime use develop as a predominantly residential, mixed use development and include parking for the adjacent marina.

The proposed project would demolish the Pier 46B building; however, the Port has already decided to relocate its maintenance facilities. The City proposes the following amendments:

PAGE II.7.5

INTRODUCTION

The Future of the Northeastern Waterfront

North China Basin Area
(Piers 26 through 46)

South of the Bay Bridge, Piers 26-38 would continue in break-bulk cargo handling and related shipping activities. Piers 42-46A and a portion of Pier 40, which are presently almost vacant and in unsound condition, would be removed and the area developed as a full service marina and small boat harbor. Inland of the harbor, a large waterfront park with dramatic views would be provided.

In March 1996, the San Francisco voters approved the development of a ballpark with a maximum seating capacity of 45,000 seats and related commercial uses for Pier 46B. This new facility will attract many visitors to the area and stimulate restaurants and night entertainment in the surrounding area. The redevelopment of Pier 46B will allow the continuation of the promenade alongside China Basin and the connection with the Lefty O'Doul Bridge and trails south of China Basin.

On inland areas, viable warehousing, industrial uses and historic structures would be retained and a mixed-income residential community with open spaces and support services would be built where vacant or underutilized property presently exists. The new community would focus on the historic Oriental Warehouse, which would be adaptively reused for a community center and commercial purposes. Walkways and bicycle paths combined with small plazas would connect the new residences to waterfront activities and other portions of the City. The new community would be characterized by high density, low to mid-rise structures, re-creating the fine-grained fabric of San Francisco neighborhoods and would take advantage of proximity to the Downtown, a desirable microclimate, amenity value of the Bay, and would help satisfy San Francisco's need for new housing.

PAGE II.7.8

OBJECTIVE 3, MARITIME AND INDUSTRIAL

POLICY 2 Continue maritime activities on Piers 35 through 9, and Piers 26 through 38 ~~and Pier 46B~~ for as long as practical. When and if it is determined that those piers are not needed for maritime use,

improvement plans should be adopted for each area and appropriate amendments made in this Plan.

PAGE II.7.9

OBJECTIVE 5, COMMERCIAL

POLICY 6 Permit an open-air ballpark with a maximum of 45,000 seats and related commercial uses at Pier 46B.

PAGE II.7.14

OBJECTIVE 10, URBAN DESIGN

POLICY 1 Preserve the physical form of the waterfront and reinforce San Francisco's distinctive hill form by maintaining low structures near the water, with an increase in vertical development near hills or the downtown core area. Larger buildings and structures with civic importance may be appropriate at important locations.

POLICY 5 Permit non-maritime development bayward of the sea wall only if the following qualifications are met:

(a) Maximum feasible public access is provided to the water's edge.

(b) Important Bay views along The Embarcadero and level inland streets are preserved and improved. Minor encroachment into the view corridors from level inland streets may be permitted under the following conditions: (1) Where the encroaching element has a distinct maritime character, is separated from the shoreline by water, and adds variety to the views along the waterfront; (2) Where minor structures (such as kiosks) are desirable to provide public amenities contributing to a continuity of interest and activity along the waterfront; ~~and~~ (3) Where essential maritime facilities cannot reasonably be located and designed to avoid blockage; and (4) Where the public enjoyment of the Bay will be enhanced by providing a place of public assembly and recreation which allows unique vistas and overviews that include portions that are publicly accessible during daytime and evenings, consistent with ensuring public safety.

PAGE II.7.17

Map 3, Proposed Height and Bulk Districts

Replace the "40-X" designation for Pier 46B with a "150-X" designation.

PAGE II.7.33

Map 5, North China Basin Area Land Use Plan

Replace the "Maritime" designation for Pier 46B with a "Ballpark" designation. (The corresponding map in the **Land Use Index**, page III.1.12, would also be changed.)

PAGE II.7.34

OBJECTIVE 26, NORTH CHINA BASIN AREA

Public Park

POLICY 1 Between King and Second Streets and the Seawall, provide approximately five to seven acres of predominantly soft-surface park for recreational use.

POLICY 2 ~~Remove or relocate the ramp structure to Pier 46B as soon as feasible.~~ Include within the park areas for active sports such as volleyball and separate areas for passive activities such as sitting, game tables under shelter, and a tot lot. Include toilet and drinking facilities. Buffer the park from The Embarcadero with devices such as landscaping, berms, and changes in elevation. Provide for drop-off parking to serve the Dolphin P. Rempp Restaurant. Provide appropriate transitions towards the proposed ballpark with its overlooks. ~~Allow a limited amount of parking with auto access from Second Street for the office building that may remain.~~ Provide a hard-surface pedestrian promenade along the water's edge with opportunities for sitting and viewing. Connect the promenade to the peripheral public access areas on Pier 40 and to the breakwater, and continue the promenade towards Third Street and Lefty O'Doul Bridge. Permit pedestrian access to the marina only from the pier and breakwater and not directly from the park. Give special care to the location of a boat ramp. Prohibit commercial activities in the park but allow a limited amount of commercial recreation use incidental to and supportive of the open space. Provide promenade railings and other elements of a design compatible with the pier and breakwater.

PAGE II.7.37

Streets, Walkways and Open Space

POLICY 1 Close the following streets completely: Berry east of Third Street ~~between Second and The Embarcadero~~, Second Street south of King Street, The Embarcadero south of King, Main south of Bryant and Fremont south of Brannan. Close the following streets to through traffic, improve them as walkways and allow only limited local and service vehicle access: Townsend between Second and the Embarcadero, Colin P. Kelly Jr. between Townsend and Brannan, First between Brannan and the Embarcadero, and Beale between Bryant and Brannan, ~~and Second between King and Berry Streets~~.

PAGE II.7.38

Pier 46B

POLICY 1 ~~**Retain the Pier 46B area for a Port maintenance facility and other maritime uses. If no longer needed by the Port for maritime use develop as a predominantly residential, mixed use development and include parking for the adjacent marina.**~~ **Develop an open-air ballpark with a maximum of 45,000 seats with related commercial uses including, but not limited to office, retail, restaurants, live music performances and other forms of live entertainment, in a setting of waterfront public spaces.**

OBJECTIVE 27, EMBARCADERO CORRIDOR

POLICY 1 Realign the Embarcadero roadway between Broadway and Berry Street as follows:

a) Widen the sidewalks in front of Ferry Building to create a major plaza as an appropriate terminus to Market Street. When the freeway is removed reroute the roadway inland to increase the plaza size;

b) Reroute the roadway inland to Steuart Street from Howard to Harrison Streets to reduce its impact on the waterfront and to create opportunities for water-related activities; and

c) Divert roadway traffic from Berry to King Streets to create opportunities for future water-related uses and to provide a direct transit link to the Southern Pacific Depot. ~~Close Berry east of Second Street and the Embarcadero roadway south of King Street.~~

PAGE II.7.43

NOTES

The following revision is proposed to the first paragraph under "Glossary of Terms":

Bay-Oriented (or Water-Oriented) Commercial Recreation and Bay-Oriented Public Assembly: Facilities specifically designed to attract large numbers of people to enjoy the Bay and its shoreline, such as restaurants, cafes, specialty shops, hotels, boatels, theaters, concert halls, galleries, amusements, night clubs, ~~and~~ cabarets, and the ballpark at Pier 46B.

Land Use Index Amendments

PAGE III.1.29

Map 4, Urban Design Guidelines for Height of Buildings

Replace the "0-40" designation presently placed on the ballpark site with the "89-160 ft." designation.

PAGE III.1.12

Map 5, North China Basin Area Land Use Plan

Replace the "Maritime" designation presently placed on the Pier 46B with a "Ballpark" designation.

Central Waterfront Plan

The project would not conflict with the major objectives of the *Central Waterfront Plan*. These objectives are to maintain and expand maritime and industrial activities, complemented by residential, commercial and recreational uses on surplus land.[3] The purpose of the *Central Waterfront Plan* is to encourage development to meet the City's economic and employment needs, without sacrificing environmental quality. The portion of the site that is subject to the *Central Waterfront Plan* would be used as interim surface parking and would not impede the long-term development of this portion of the site as reflected in the Central Waterfront Plan.

Specific Plan for the Mission Bay Planning Area (Mission Bay Plan)

The project's proposed parking areas south of the channel are within the Mission Bay planning area. The land use designations for this area include open space, industrial, hotel, commercial and

residential. Interim uses are contemplated in the Mission Bay Plan and are specifically authorized under Article 9 of the Planning Code for up to ten years.

Planning Code

Northeast China Basin Special Use District

Proposition B created the Northeast China Basin Special Use District, which accommodates the construction of an up to 45,000-seat capacity open-air ballpark with related commercial uses. Proposition B amended the Planning Code to: authorize the ballpark and related use as a conditional use, provided that there is no minimal parking requirement for such a use; establish the criteria for conditional use authorization by the Planning Commission; amend the City Planning Code Height and Bulk District to 150-X; and exempt light standards associated with a ballpark from height limitations.

Construction of the ballpark as proposed would be consistent with the Special Use District provisions described above, provided that the Planning Commission finds the architectural design of the structure meets the criteria of Section 249 [1d](b)(4).

PORT OF SAN FRANCISCO

Draft Waterfront Land Use Plan

The *Draft Waterfront Land Use Plan* (Draft WLUP) has not yet been adopted by the Port, and therefore does not currently apply to the project. If adopted as proposed, the Plan would define the project site as a part of the China Basin Mixed Use Opportunity Area and identify a stadium or sports facility as an acceptable use, contingent on certain findings. The following would be necessary in order to achieve consistency with the provisions of the Draft WLUP:

- The project site design, public access improvements and architectural treatments would require an orientation to the Bay;

- The project would be required to include a transportation plan with incentives to maximize use of public and group transit, a parking program that maximizes shared use arrangements with parking operators in the vicinity, and a requirement that any new parking areas be located away from the water; and
- A compensation package acceptable to the Port Commission that ensures fair market return to the Port for this use of its property would be required.

The project sponsor is in the process of preparing a transportation plan and negotiating a compensation package consistent with the final objective. Consistent with a number of objectives identified in the Draft WLUP, the project includes several measures designed to provide or improve public access to the site, including the improvement of existing walkways and the establishment of an elevated walkway providing sight lines into the ballpark; the improvement and extension of the Port Walk; a design that orients as many seats as possible towards the Bay; and restaurant uses that focus on the waterfront characteristics of the site.

SAN FRANCISCO REDEVELOPMENT AGENCY

The portion of the project site within the *Rincon Point - South Beach Redevelopment Plan* is designated "Park" under the Plan and has been proposed for expansion of South Beach Park. The plan for the park described in the Redevelopment Plan has been reconfigured by SFRA, and will no longer require the portion that includes part of the ballpark site. The *Rincon Point - South Beach Redevelopment Plan* would be amended to exclude this portion from the area proposed for ballpark development.

The project also includes amendments to the *Rincon Point - South Beach Redevelopment Plan* (including the companion Design for Development document) to enlarge the Plan area to include those portions of the project site not already included with the Plan area, and to amend the land uses and development standards of the Plan to reflect the ballpark.

The proposed amendments to place the entire site in the Redevelopment Plan Project area and reflect the revised land use designation and development standards would need to be found consistent with State Redevelopment Law and the policies within the *Rincon Point - South Beach Redevelopment Plan*.

BAY CONSERVATION AND DEVELOPMENT COMMISSION

San Francisco Bay Plan

The project would require fill associated with improving shoreline appearance and public access. Construction of the extension of the waterfront walkway would require fill of the area between the existing walkway and the end of the waterfront promenade, to allow for continuous public access across the Port Walk. Fill would also be required to replace the leading edge of the walkway, frame the walkway, and repair the bulkhead. In addition, the ferry service would require fill. The San Francisco Bay Conservation and Development Commission (BCDC) would be required to find that such fill was consistent with the McAteer-Petris Act. The term "fill" includes earth or any other materials including pilings. The *San Francisco Bay Plan* allows minor fills for improving public access (p. 36).

As noted on p. III.21, water-oriented commercial recreation and public assembly is favored in the *San Francisco Bay Plan*, with the recommendation that such uses be distributed along the shoreline to avoid undue concentration. The project design contains elements which seek to open the project to the waterfront, allow views of the waterfront, and integrate pedestrian features with views of the water. It also incorporates pedestrian access to encourage use by persons in addition to those who are visiting the site for the purpose of attending a game. The project is consistent with these policies.

Waterfront Special Area Plan

The project is consistent with the *Waterfront Special Area Plan* policies for improving and developing the waterfront according to a detailed plan which sets forth a balanced program to attain economic, environmental and social goals, and recognizes that increased public recreation is essential to the shoreline. The *Waterfront Special Area Plan* states the following:

> The waterfront and adjacent inland areas between the Bay Bridge and China Basin hold potential for development as [a] a unique residential area in conjunction with commercial, existing industrial, and open space uses.

The Plan further identifies the area between the Bay Bridge and China Basin as a likely area for change in use in coming years. The Plan mentions that while maritime uses of the piers in this area still take place, they are expected to be available for non-maritime development within a few years. The Plan also recognizes the potential public benefits which could be obtained through waterfront revitalization and emphasizes that the basis for accommodating seemingly conflicting uses is to be "...guided by overall planning responsive to public desires."

The Plan also states:

> Waterfront land is both valuable and scarce, and therefore should not be used for automobile access and parking unless absolutely necessary for permitted uses, no upland location is available, and it is the minimum necessary.

New parking designated for ballpark would include approximately 5,000 spaces, some of which is located on waterfront. The parking is an interim use and would not preclude other uses related to the waterfront in the future.

The *Waterfront Special Area Plan* also incorporates on pages 7-8 the policies of the Special Area Plan regarding fill for improvement of public access.

STATE LANDS COMMISSION

A portion of the site is subject to the public trust and may only be developed with uses that are consistent with the public trust and the Burton Act. The project may be consistent with the public trust, primarily because it has been designed in large part to facilitate public access to an area of the waterfront which is currently inaccessible, and to promote waterfront recreational and visitor-serving uses. In particular, the ballpark includes the development of a public viewing area adjacent to the playing field which would create new access to the site and present an attractive area for visitors. The project design contains elements which seek to open the project to the waterfront, allow views of the waterfront, and integrate pedestrian features with views of the water. It also includes other pedestrian access to encourage use by persons in addition to those who are visiting the site for the purpose of attending a game.

The SLC's preliminary view of the project is that the ballpark is a permissible land use if it is a "part of a larger development scheme of mixed uses along the waterfront geared to bring the public to the area."[4]

NOTES - Consistency with Existing Plans and Policies

1. Proposition B, Section 8, approved by the voters of San Francisco, March, 1996.

2. San Francisco Department of City Planning, *Northeastern Waterfront Area Plan*, adopted by City Planning Commission Resolution 7643, January 31, 1980 and as amended.

3. San Francisco Department of City Planning, *Central Waterfront Plan*, adopted by City Planning Commission Resolution 8631, July 3, 1980.

4. Letter to Barbara Sahm, Environmental Review Officer, from David E. Plummer, Public Land Manager, State Lands Commission, July 25, 1996.

B. LAND USE

INTRODUCTION

The proposed project involves the construction of a 42,000-seat open-air ballpark and facilities for commercial and restaurant uses which would be completed prior to the beginning of the baseball season in the year 2000.

The project includes a proposed amendment to the *Rincon Point - South Beach Redevelopment Plan* project area boundaries. The amendment would also revise the land use designation and development standards in the *Rincon Point - South Beach Redevelopment Plan*[1] and its companion *Design for Development* document to reflect the ballpark. This section discusses the effects of changes in land use on the project site that would result from the proposed project, the compatibility of the resulting land uses with existing land uses, and the potential effect these changes could have on land use patterns in the project vicinity.

PROJECT SITE

Construction of the proposed ballpark would require demolition of all existing buildings on the project site and the displacement of the existing uses. Table IV.B.1 contains a list of these buildings. Currently, these buildings are used for commercial, light-manufacturing and maritime-related activities.

Northern Portion of the Site

Eight one- and two-story buildings on the King-Second-Berry-Third block, all fronting Berry Street, would be demolished as part of the project. The buildings to be demolished include warehouses, artist space, office, a metal-working shop and storage space.

TABLE IV.B.1
BUILDINGS TO BE DEMOLISHED●

Assessor's Block	Height (Stories)	Gross Floor Area (sq. ft.)
Block 3794[1]		
860 Second St.	2	23,000
30 Berry St.	1	10,000
36 Berry St.	1	5,500
40 Berry St.	1	3,300
44 Berry St.	2	14,200
66 Berry St.[2]	2	30,000
50 Berry St.	2	10,300
70 Berry St.	1	15,000
Block 9900		
Pier 46B	2	204,300[3]
Pier 46C	2	100,300
95 Berry St.	1	11,100
Total Floor Area (sq. ft.)		**427,000[3]**

Notes:
1. Floor areas are approximate for the Caltrans property.
2. Partial second story.
3. Plus about 86,000 sq. ft. of auto ramp and roof parking (open area).

Source: Paul Osmundson, Director of Planning, Port of San Francisco, February 1997.

Construction of the proposed ballpark would eliminate about 300 public parking spaces at the southeast intersection of King Street and Third Street. This lot was developed after the partial demolition of buildings on the south side of King Street between Second and Third Streets for expansion and improvements to King Street. Most of these spaces are used by people who work in the vicinity or who, because the rate is much lower than Downtown

parking, park and then take transit to Downtown. Development on such lots is a continuing trend in the area. The proposed project does not include any parking that would be available to the public on a daily or monthly basis on-site.

Southern Portion of the Site

The project would demolish the two warehouse buildings on Piers 46B and 46C and 95 Berry Street, a small one-story building west of Pier 46C. The majority of the maritime-related uses are located in Pier 46B and include Port of San Francisco (Port) activities as well as private businesses. The primary Port uses are related to the Maintenance Operations Facilities (MOF). The Port is currently pursuing relocation of the MOF to provide more efficient and economical operations. The Port was scheduled to move the MOF to Pier 48 in August 1997; however, the pier is currently undergoing renovation and rebuilding, due in part to a fire on the pier. The Port will relocate the MOF to Pier 50 on an interim basis.

The other businesses located in Piers 46B and 46C would also be vacated prior to demolition. Half of the 12 tenants will relocate to Pier 50 as "short-term interim uses."[2] There are relocation opportunities south of the project site, particularly around Piers 70 and 80 located at Twentieth Street and Cesar Chavez Street, respectively. Non-maritime businesses could potentially relocate to other sites in the project vicinity, both north and south of the Channel. Other M-2 (Heavy Industrial) areas are generally located along the waterfront, north of the project site to the Bay Bridge at Harrison Street and south along the Central Basin, Islais Creek Channel and India Basin. South of the project site, M-2 uses extend inland along I-280 to Cesar Chavez Street and then along the James Lick Freeway.

PROPOSED PROJECT LAND USES

Following demolition and site preparation, the project site would be developed with a 42,000-seat open-air ballpark and facilities for commercial and restaurant uses. The existing one- and two-story buildings and paved areas around the buildings presently used for storage, parking and loading would be replaced with the ballpark, portions of which would be up to 150 ft. in height, which is equivalent to about ten stories. Approximately 355,000 sq. ft., or 65 percent, of the site would be enclosed at grade.

The ballpark would include a four-story element, the Pavilion Building, along Third Street. Uses in the Pavilion Building would include retail, office, broadcast studio and educational facilities. All uses in the Pavilion Building would be year-round, including the Giants' administrative offices.

The office and broadcast studio uses would be somewhat similar to the office uses in the China Basin Landing and China Basin Buildings across Third Street at China Basin Channel. The Pavilion Building scale and use would be similar to some of the large outlet and retail centers on and to the west of Third Street. The Pacific Bell Children's Learning Center and Communications Center would be a destination use, as well as a general visitor-serving use. It is anticipated that some visitors may come for the sole purpose of visiting the center, and others may visit in conjunction with other activities in the area, such as shopping at the retail outlet stores in the area, attending a baseball game, or visiting the waterfront.

The project would include restaurant/bar uses located on the Second Street right-of-way near the waterfront. It is anticipated that both the lower-level and top-level restaurants (about 35,000 sq. ft.) would be open during normal dining hours on a year-round basis.

The area proposed for restaurant/bar uses is presently used primarily to access the adjacent marina and fishing pier. The restaurant uses would attract visitors to the area and would also draw pedestrians further south who are already in the South Beach area. This would allow

public use of the walkway in front of Pier 46B, proposed for improvement as a Port Walk. Although there is a walkway on Pier 46B, it is not presently accessible to the public. A shared entrance drive to the ballpark's internal parking component, and SFRA parking, would be located immediately to the east of the ballpark.

PROJECT VICINITY

As discussed on pp. III.28 - III.35, land uses in the surrounding area include residential along The Embarcadero; small-scale commercial and office to the northwest; proposed retail and residential to the west; and rail, parking and industrial uses to the west and south. Ballgames and other possible events inside the ballpark and the new restaurant and commercial uses would attract visitors to the site year-round. Those attending games would use the streets of the project vicinity for each game. The development of 181,000 sq. ft. of commercial and restaurant space would establish the ballpark as a major destination for San Franciscans and for visitors.

The ballpark and year-round commercial activity would increase pedestrian activity and could result in an increase in the development of pedestrian-serving uses in the project vicinity. This would include uses such as restaurants and bars that would cater to the baseball crowd (see IV.K. Growth Inducement, pp. IV.330 - IV.334 for discussion).

Compatibility With Surrounding Uses

The *Rincon Point - South Beach Redevelopment Plan* recommends residential use with neighborhood commercial for most of the South Beach subarea. Existing residential uses within a radius of one to three blocks from the project site include the Steamboat Point, South Beach Marina, Bayside Village and Delancey Street Foundation apartment complexes.

Residential uses are expected to increase in the project area. Diagonally across from the project site at the King and Second Streets intersection is a parking lot with two vacant buildings in the *Rincon Point - South Beach Redevelopment Plan* area approved for residential development. Elsewhere in the Rincon Point - South Beach Redevelopment Area, other approved residential projects include: Oriental Warehouse Phase II along Brannan Street between Colin P. Kelly Jr. and Delancey Streets (356 units); Site F-1 at Brannan and

Delancey Street; and Site F-2 at Federal and Delancey Street. Portside Phase II is an approved residential project located at the intersection of Harrison and Main Streets (158 units). Each of these is indicated on Figure III.B.1, p. III.27, with an asterisk.

In the area of Mission Bay north of China Basin Channel, Catellus Development Corporation currently is proposing up to 3,000 dwelling units as well as up to 600,000 sq. ft. of entertainment/commercial at Third Street between Townsend and Berry Streets. The *Mission Bay Specific Plan* also includes significant residential development in the area south of the Channel.

The major new use that the proposed project would introduce is an open-air ballpark where crowds could attend ballgames, concerts and other events. Ballgames would occur about 80 times over a seven-month season, whereas all other activities and events would attract substantial numbers of visitors year-round. (Pacific Bell has projected that the children's learning center would attract 50,000 visitors per year.) Potential adverse effects on nearby residential and commercial uses due to increased pedestrian and auto activity and increased noise levels are discussed in IV.E. Transportation and Circulation, p. IV.144, and IV.F. Noise, pp. IV.245 - IV.251.

Increased Pedestrian Activity

The development of a ballpark would result in an increase in the number of people visiting the project site during daytime and evening hours. Currently, no other uses in the project vicinity attract a population of the magnitude commonly associated with a major league sports event (see IV.K. Growth Inducement for further discussion). The project's commercial development would also create new retail activity.

The development of a ballpark and facilities for commercial and restaurant uses is likely to result in an increase in demand for ground-floor retail and commercial space in this area. Current vacancies in the project area include warehouse and light-industrial buildings as well as some ground-floor retail in adjacent residential developments. The land uses in the area are a mix of uses (predominantly multi-family residential and neighborhood-serving and other commercial to the east and northeast, South of Market uses to the north and Mission Bay to the west) and includes M-2 zoning immediately to the north of the site, which allows for the

concentration of light-industrial and warehouse use. Construction of the proposed ballpark could increase pressure on nearby vacant warehouse and light industrial space to convert to other uses, thereby increasing the ratio of non-industrial use in the area. It is possible that the increase in demand for such space could also result in the conversion of planned residential and neighborhood-serving uses to commercial use. Catellus Development Corporation's proposal to develop a North of Channel residential and retail/entertainment project in the area bounded by Seventh Street, Townsend Street, Third Street and the China Basin Channel and development anticipated in the Port's *Waterfront Land Use Plan* could alleviate some of the pressure on adjoining uses to serve the increased pedestrian traffic.

The *Rincon Point - South Beach Redevelopment Project Area Plan* encourages the development of neighborhoods with multi-family housing and neighborhood-serving commercial use along the waterfront from the Bay Bridge to China Basin. Development of the ballpark and associated uses on the waterfront and development in Mission Bay could encourage the development of the area as a commercial center. This could change the amount and type of development proposed in the area and may increase the pace of new development.

- Neighborhood Effects

As discussed in the preceding two sections, the project vicinity, which includes a large residential community, retail community and active maritime uses, would be specifically affected on game days or during other events at the ballpark. These communities would experience auto and pedestrian congestion immediately before and for a while after games. Transportation access would be limited for those accessing residential parking spaces, place of business parking, and recreational activities located in the area. Effects one anticipates from large crowds, such as noise, crowds, and the potential for increased litter would occur.

Ballgames and other events would occur on the weekends and could annoy and inconvenience those trying to visit and use non-ballpark uses in the area, e.g. the marina, residences and businesses. South Beach Harbor and Park activities, such as boat races, the quiet enjoyment of the marina and park, and off-loading for boat races, would require advance planning.

Development of the ballpark could have a positive effect on some local businesses as some fans would likely stay in the area and patronize existing businesses. Business owners might enjoy the close proximity of the ballpark and the increased pedestrian traffic in a redeveloping area.

- Improvement Measure

  - The Port Commission could establish a process to require special authorization for use of the ballpark for non-baseball events to minimize possible adverse effects on the neighborhood. Issues that might be considered in authorizing such events could include ending times for concerts and/or other responsibilities that could be imposed to minimize ancillary effects such as increased litter or noise.

  - In order to address concerns arising from ballpark and event activities the Giants could identify a community liaison who would be made known to neighbors and other concerned parties. The community liaison could establish a committee including representatives from the neighborhood and appropriate city agencies to develop measures that could be implemented to minimize undesirable non-significant impacts that might occur during events at the ballpark.

Parking

Approximately 5,000 dedicated parking spaces for the project are planned in the Mission Bay South of Channel area on lots owned by Catellus Development Corporation and the Port (see Figure II.D.5, Proposed South of Channel Parking Areas, p. II.20). The properties would

be leased as an interim use with improvements to surface and lighting conditions. This would create an expanse of paved parking lot use along portions of the Third Street corridor that are now mostly vacant or occupied by interim industrial uses. The proposed parking areas along Terry A. Francois Boulevard would increase traffic congestion in the area and could delay access to existing maritime commercial and recreational activities. See the discussion on pp. V.6 - V.40 regarding the proposed traffic routing plan and associated effects.

The commercial entertainment/recreation use, the Bladium (a rollerblading rink), would be retained on its site at Third Street, as would Fire Station 30 at the corner of Third and Fourth Streets. Permanent structured parking would be developed by the year 2015 based on the demand experienced and in conjunction with re-planning the South of Channel area.

Open Space/Waterfront Access

Across the Second Street right-of-way adjacent to the proposed ballpark the SFRA proposes to extend South Beach Park to the south along the waterfront. The existing park provides local office workers, residents, and tourists with public benches, waterfront views, and access to water-oriented entertainment, and the *Rincon Point - South Beach Redevelopment Plan* currently calls for the development of additional parking and an extension of South Beach Park to the south across the Berry Street right-of-way and into the Second Street right-of-way. The SFRA is in the process of redesigning the expansion of the park with below-ground parking under an earthen berm. The parking structure would share an entrance from King Street at Second Street with the ballpark's internal parking component. Sharing an entrance with the project would allow the SFRA to increase the number of parking spaces developed to serve Harbor patrons. The proposed ballpark would be built over the entire Second Street right-of-way.

The ballpark, learning center, broadcast studios, and retail development would open Block 3794 (the Second-King-Third-Berry block) and the piers to pedestrian use. The proposed waterfront location would attract pedestrians for its distinctive views. The ballpark design emphasizes access to the water and is oriented so the majority of seats in the ballpark would have views of San Francisco Bay. The widening and improvements to The Embarcadero, just north of the site, have increased pedestrian access and use in that area. The Port Walk, an access way planned along the waterfront perimeter of the ballpark site, would continue the development of a pedestrian-friendly environment. This, in turn, would increase the use of South Beach Park, the proposed park extension and the site, drawing visitors further south along the waterfront.

NOTES - Land Use

1. San Francisco Redevelopment Agency, *Rincon Point - South Beach Redevelopment Plan*, adopted and approved January 5, 1981 and as amended, p. 16.

2. The other Port tenants will relocate to other areas not on Port property. Kari Kilstrom, Planner, Port of San Francisco, telephone conversation, February 24, 1997.

C. VISUAL QUALITY AND LIGHTING

Changes in visual quality and lighting would result from three aspects of the proposed project: 1) demolition of the existing buildings on the site; 2) construction of the ballpark complex inclusive of buildings, ballpark seating, playing field, site lighting, pedestrian amenities and appurtenant facilities; and 3) development of the parking areas and associated lighting south of China Basin Channel.

DEMOLITION

Eleven buildings on the project site containing about 427,000 square feet (sq. ft.) of space plus about 86,000 sq. ft. of auto ramp and roof parking would be removed prior to ballpark construction. This is discussed in greater detail in II, Project Description, p. II.23. The structures that would be removed are utilitarian in appearance. In addition, demolition would remove stored materials, machinery, artifacts and equipment related to existing industrial and maritime activities on the site.

PROPOSED BALLPARK

In assessing changes in visual quality that would result from the construction of the proposed ballpark, it is necessary to describe the physical components of the project that would determine its visual makeup and character. The various aspects of the ballpark's proposed design elements and related changes in the visual quality of the site are discussed below.

Design Concept

The project design is intended to reflect the history of baseball architecture that prevailed in the early part of this century. The King Street facade would have traditional design featuring

the use of red brick and exposed steel beams. The asymmetrical field dimensions and varying heights and angles of the outfield walls would be reminiscent of older ballparks such as Fenway Park in Boston.

Pedestrian Facilities

Pedestrian entrances would be at each of the four corners of the project site. The main entrance to the ballpark would be at the intersection of King and Third Streets. This entrance would be visually identified with a pedestrian plaza located at the entry featuring stone paving and the Willie Mays Sculpture Garden consisting of 24 specimen trees planted within the plaza.

Other pedestrian entries would be at the intersections of King and Second Streets, Third Street opposite the Lefty O'Doul Bridge and at the waterfront near the southwest corner of the South Beach Harbor. The streetscape would include columnar deciduous trees at 22-ft. intervals adjacent to the curb along Third Street. Four-foot square iron tree grates would cover the street tree pits. As noted previously, street trees (sycamores) have been planted along King Street as part of the King Street and The Embarcadero improvement projects. Other pedestrian amenities of decorative surface paving, seating and lighting would be provided along the Port Walk along China Basin.

Street Frontages and China Basin Locations

King Street

The King Street facade would extend to a height of 78 ft. above street level and traverse a full city block between Second and Third Streets, a distance of about 900 ft. A clock tower set into the facade at each end of the structure and rising to about 125 ft. at the peak of the

roof would visually terminate each end of the building at King Street. Rising above the King Street building frontage would be the steel-frame superstructure supporting the upper ballpark seating bowl. The ballpark's King Street frontage would not have retail uses, which would generally be at the Pavilion Building at Third Street, between King Street and China Basin. The King Street frontage would have building lighting and street lighting, and would be adjacent to streetscape elements and the MUNI light-rail median as part of the King Street continuation of The Embarcadero roadway.

At 130 ft., the ballpark structure would be taller than other buildings in the vicinity, with the exception of the uppermost building elements of the South Beach Marina Apartments complex, estimated to be about 130 to 140 ft. in height. The light towers would rise to about 175 ft. above grade. Figure IV.C.1 illustrates the view of the ballpark looking south down Third Street near Townsend Street. From this view, the ballpark would appear to be larger and taller than surrounding buildings. Because upper levels of the ballpark would be stepped back progressively from the King Street frontage, the full height of the structure would not be readily apparent to the pedestrian or motorist from close-in vantage points.

The seating bowl, rising to a height of about 112 ft., would be separate from the ballpark facade and would generally be oriented away from King and Third Streets, facing in south and east directions toward China Basin and the Bay, respectively.

Figure IV.C.2, p. IV.29 shows the view of the proposed project from The Embarcadero looking south. The ballpark structure rising to approximately 130 ft. and the lighting standards rising to about 175 ft. above the existing grade would be viewed from this location. The seating bowl and supporting steel structure would make the presence of a ballpark readily apparent from this viewpoint. Because of its height and structural elements supporting the seating and lighting, the ballpark would become a visual anchor at the south end of The Embarcadero.

The ballpark would have windows set into the building face at regular intervals on the first and second levels. Each window would be subdivided into individual panes intended to be

SOURCE: Square One Productions

GIANTS BALLPARK

Figure IV.C.1 Photosimulation View Looking Southeast: Third Street at Townsend Street

SOURCE: Square One Productions

GIANTS BALLPARK

Figure IV.C.2 Photosimulation View Looking South from The Embarcadero (Herb Caen Way) at Pier 40

reminiscent of window styles consistent with older industrial buildings in the South of Market Street area. The glazing would be tinted light green.

Drivers and pedestrians approaching the ballpark from the north on Second Street would have views of the ballpark. These views would primarily be of the easterly portion of the King Street facade, with the corner clock tower in the foreground and light standards and scoreboard in the background. Views of the rest of the ballpark from Second Street would be limited because of existing buildings on the west side of Second Street, between King Street and Brannan Street. Existing views south of Second Street can include vessels moored at Pier 50, south and east of the ballpark site. The ballpark would limit some of these views of Pier 50. At Second Street near King, views would include the King Street facade, outfield walls, and scoreboard, with the South Beach Harbor and the Bay to the east.

Third Street

The Pavilion Building would be located along Third Street. The Pavilion would consist of four levels, each progressively stepped back from the Third Street frontage (see Chapter II, Project Description, Figure II.D.4, p. II.17 for a view of the Third Street frontage and aerial perspectives). The facade immediately adjacent to the sidewalk would be 46 ft. high, while two stepped-back upper sections would rise to about 80 ft. high. Pedestrians near the Pavilion would see portions of the facade, depending upon the location of the viewer.

The Third Street frontage would include a proposed pedestrian entry into the ballpark and Port Walk near the Lefty O'Doul Bridge. The building and ballpark entry would be set back approximately 90 ft. from Third Street and the Lefty O'Doul Bridge and China Basin Landing structures to create a pedestrian plaza. Figure IV.C.1, p. IV.28 illustrates a view of the ballpark looking south on Third Street. From this location, the ballpark would appear larger and taller than surrounding buildings.

China Basin

The Port Walk adjacent to China Basin at the south side of the project site would be proposed as part of the project to improve waterfront access. Waterfront uses of the project would

include retail uses and a waterfront restaurant, a covered arcade through which views of the playing field are possible, and turnstile entries into the ballpark.

Elements of the waterfront frontage would extend east from Third Street along the Port Walk. The primary ballpark element to be seen from the Port Walk would be an approximately 24-ft.-high arcade wall along the south (waterfront) side of the playing field containing a series of 16-ft.-wide by 18-ft.-tall arched window areas and similar-sized arched entries into the ballpark. The arched window and entry area wall would be about 640 ft. in length extending east from the Third Street frontage to the centerfield restaurant at the southeast portion of the ballpark.

- From locations in China Basin, in South Beach Harbor or from Pier 46B south of the site, views would include the ballpark Port Walk wall and arcade, visible east of the Lefty O'Doul Bridge and the 900-ft.-long, six-story China Basin Building.

- Figure IV.C.2a, p. IV.31a, shows the proposed ballpark as viewed from the easterly end of the breakwater fishing pier at South Beach Harbor. The project would replace views of the existing Pier 46A structures with the 130-ft.-high, ballpark structure the 125-ft.-high scoreboard, and the 975-ft.-high light standards; China Basin would be in the foreground.

The walkway would be concrete with either an exposed aggregate or salt-textured surface. The China Basin dock edge would be replaced with either a cast-in-place or precast concrete nosing. A railing and concrete seawall system would extend the full length of the Port Walk with pole-mounted pedestrian lighting along the wharf edge. As part of the Port Walk, the Pier 46B bulkhead would be repaired and strengthened; the new walkway would connect to the existing South Beach Harbor promenade. An approximately 1,500-sq.-ft. pile-supported concrete pier would connect the bulkhead and new walkway at the east end of Pier 46B as a ramp to the south end of the South Beach Harbor walkway and seawall. The historic seawall would not be affected by the project. See IV.J. Water Quality and Aquatic Ecology, pp. IV.314 - IV.315, for a discussion of impacts from the proposed bulkhead repairs. If ferry service were implemented, this area would provide additional queuing area for ferry boat passengers and for the unloading of passengers prior to a game. The Port Walk would provide pedestrians with views of the Bay.

SOURCE: Square One Productions

GIANTS BALLPARK

● **Figure IV.C.2a Photosimulation View Looking West from South Beach Harbor**

South Beach Park

The building facade as described for the King Street frontage would continue on the east-facing side of the building fronting South Beach Park, for a horizontal distance of about 200 ft. A "Pacific Bell Park" sign in 10-ft.-high letters would be mounted at the upper concourse level as described in the Ballpark Lighting and Scoreboard discussion below. Extending from this portion of the building south to the scoreboard would be an approximately 16-ft.-high wall enclosing parking and service areas. Access for deliveries,

refuse pick-up and maintenance is proposed at a service drive along Second Street with vehicles entering south from King Street.

Figure IV.C.2, p. IV.29 shows the proposed ballpark as viewed opposite Pier 40 north of South Beach Park. Under existing conditions, the upright steel sculpture at South Beach Park dominates in the field of view while the Ship Clerks Association building and adjacent tree mass screen views to the Port of San Francisco Maintenance Operations Facility. As illustrated in Figure IV.C.2, the proposed ballpark would be a substantial additional structure within the field of view from the Pier 40 and South Beach Park area. From the vantage point shown the scoreboard and vertical lights in the background rising to about 175 ft. would be seen with the 40-foot-high di Suvero sculpture in the foreground. The ballpark structure and seating bowl would be partially screened by palm trees within The Embarcadero right-of-way, thus shielding from view the overall mass of the structure as defined by its length, width and height. Views to interior portions of the ballpark from South Beach Park would be shielded by the approximate 16-ft.-high wall located between the scoreboard and King Street.

Potrero Hill

The ballpark would be visible from Potrero Hill to the southwest. Figure IV.C.3 illustrates the proposed ballpark as it would appear from Vermont Street near Eighteenth Street approximately one and one-half miles from the project site.[1] Primary features of the ballpark that could be viewed from Potrero Hill include the ballpark seating, scoreboard and light towers. The seating bowl would not substantially obstruct views toward the Bay from Potrero Hill.

The existing six-story China Basin Landing Building would screen views of the ballpark. The scoreboard would obstruct a small portion of the view toward the Bay and the eastern portion of the Bay Bridge from the vantage point shown on Potrero Hill.

SOURCE: Square One Productions

GIANTS BALLPARK

Figure IV.C.3 Photosimulation View to Northeast from Roof of International Studies Academy at 693 Vermont Street, Between 18th and 19th Streets

BALLPARK LIGHTING AND SCOREBOARD

Lighting[2]

This analysis assesses spill light, obtrusive light and glare that might be associated with the proposed ballpark's lighting facilities. The following terms are used in this discussion:

- **Spill light**: The light emitted from an installation which falls outside the boundaries of the property on which the lighting system is installed.
- **Obtrusive light**: Spill light which causes annoyance, discomfort, distraction or a reduction in the ability to see essential information such as traffic signals.
- **Glare**: The discomfort or impairment of vision experienced when the image is excessively bright in relation to the general surroundings.
- **Foot-candle**: The recognized international unit for the measure of light (illuminance) falling onto a surface.

Spill light can be accurately calculated and the effects of spill light can be measured for general understanding and comparison. The effects of **obtrusive light** are, however, the subject of debate and technical discussion throughout the lighting community. Attempts have been made to quantify obtrusive light, but has proven to be difficult as individuals have a range of reactions to the perceived effects of lighting on the environment. Typical nighttime street lighting requirements are 1 to 3 foot-candles, which is considered to be unobtrusive.

Glare created by sports-lighting systems can be measured for impairment of view. A typical example of glare effects is the car headlight. When viewed directly in front of a vehicle with the headlights on full beam, vision is impaired, resulting in disability glare. However, when viewed from the side, the same headlights will not impair vision.

The following are examples of light levels, expressed in **foot-candles**:

Bright and sunny day:	3,000 foot-candles
Professional baseball-field lighting:	300 foot-candles

Office:	50 to 75 foot-candles
Residential lighting at night:	7 to 10 foot-candles
Main road junction street lighting:	2.5 to 3.0 foot-candles
Bright moonlight:	0.1 foot-candle

The analysis includes comparing the contrast between a sports light bank and the environment. The view of a sports light bank against a black sky is measured differently than a sports light bank seen against normal city lights. The further from the ballpark the viewer is, and the more general city lights there are in the normal view along with the ballpark lights, the less glare the viewer would experience.

The playing field would be illuminated with three sets of light towers. Two sets of light towers would rise above the seating bowl, one above the first-base line, and one above the third-base line. The light towers would be the highest structural elements at the ballpark, extending to a height of 175 ft. above existing grade, about 60 ft. above the top-seating row. These two panels of lights on each side of the playing field would each be about 86 ft. wide and 10 ft. high.

The third set of lights would be located in centerfield above the restaurant and scoreboard to provide adequate lighting for the outfield. The scoreboard would consist of a series of illuminated panels with the outfield lights at each end of the scoreboard rising to a height of about 175 ft. above the existing grade.

The ballpark would substantially increase light intensities during the approximately 40 night games per year. Night illumination of outdoor areas can affect people in several ways. For example, where intense lighting is viewed against a dark background, the contrast attracts the attention of the viewer and could be considered annoying. Under low-light conditions, the human eye adjusts to the brightest light within the field of view. If the range of light intensity to which the eye is exposed is large, the eye will be relatively insensitive to the more dimly lighted areas within the field of view. In addition, increased illumination can

affect the suitability of sleeping areas, use of outdoor areas at natural light levels, and privacy. The degree of impacts may be related to the degree of change from the illumination levels to which people have become accustomed.

Figure IV.C.3a presents contour lines for Maximum Vertical Values, in foot-candles, of field-lighting spill effects around the ballpark. Maximum Vertical Value refers to light levels observed looking directly at the source. (The use of the term "maximum vertical," is a convention, and does not necessarily represent a 90 degree vertical view.) The spill lighting analysis also computed estimated Horizontal Values and Vertical Values. Horizontal or Vertical Values represent measurements in 90 degree directions. Those values represent foot-candle levels from light sources not necessarily directly viewed by an observer, and would generally be lower than Maximum Vertical Values. For example, the "5" contour in Figure IV.C.3a represents a distance at which a measurement looking directly at the light source would be 5 foot-candles. The different values would be those recorded by a light meter in, for example, South Beach Park pointed directly at the light standards (Maximum Vertical Value), straight ahead (Horizontal Value), or straight overhead (Vertical Value). Horizontal values would be those experienced by an observer looking straight ahead, even if the light source were above the observer.

Each light analysis identified in this report views the ballpark from different locations. These locations represent typical viewpoints that exist around the proposed ballpark.

Location 1, The Embarcadero and King Street

Location 1 is at ground level and approximately 800 ft. north of the site, at The Embarcadero and King Street. The view would be as seen from an automobile or pedestrian traveling toward the ballpark. The outfield light banks at the scoreboard and mid-field light banks within the ballpark would be seen from this view. The light reflectors would not be

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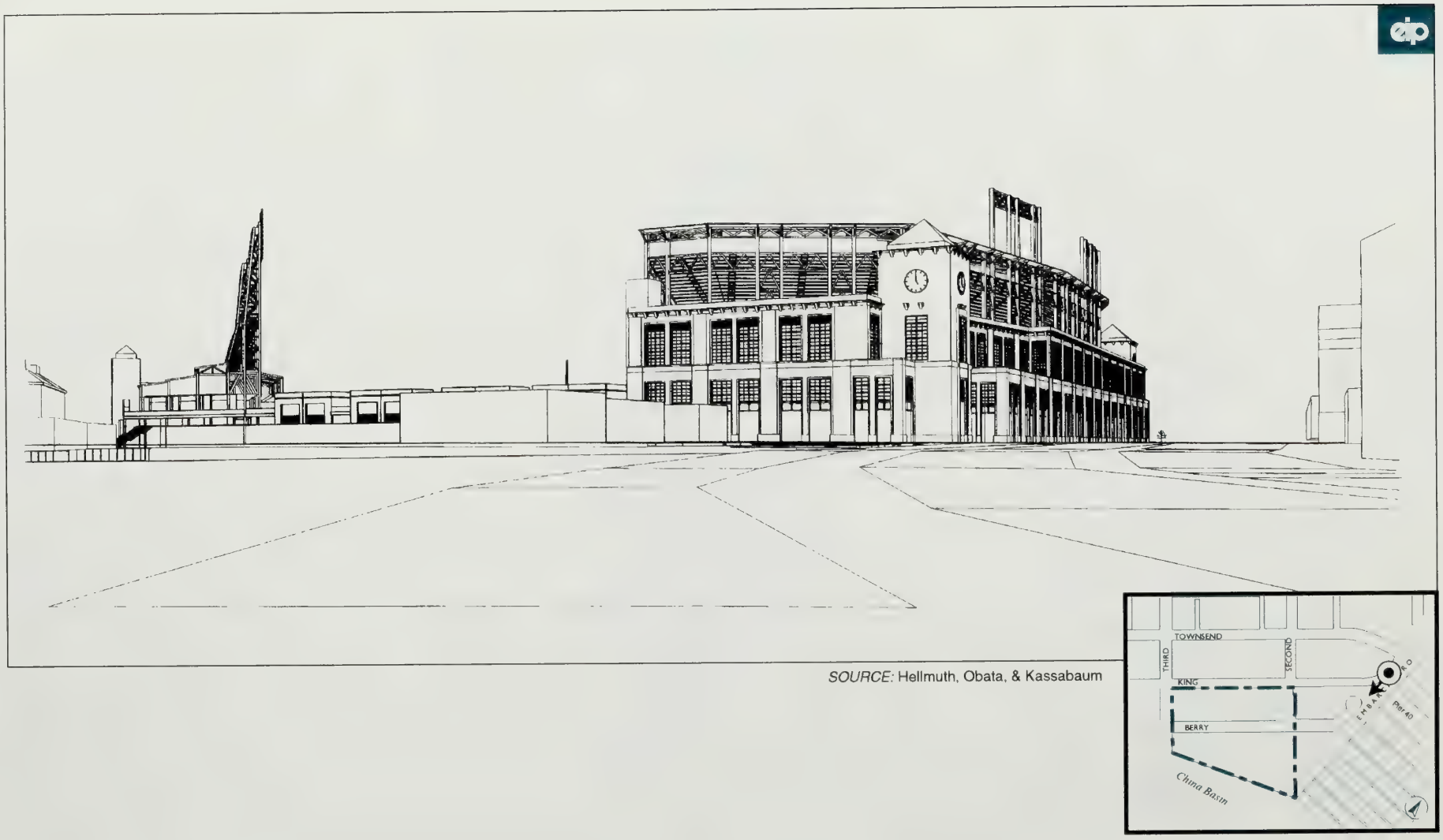
● Figure IV.C.3a Spill Lighting Analysis

visible because the outfield bank would be angled (see Figure IV.C.4). The linear mid-field and infield bank would be viewed from behind the reflectors.

Computer modeling indicates that spill light from ballpark lighting in all directions would be unobtrusive at less than 1 foot-candle. The illumination emitting from the lighting fixtures would be seen at their source, but there would be no obtrusive light or glare causing vision impairment. Ballpark lighting would be supplemented by street lights and surrounding buildings during nighttime hours.

Location 2, Third and King Streets

Location 2 is at ground level directly opposite the ballpark site, looking east from Third and King Streets. The distance to the ballpark main entrance would be less than 300 ft. The view would be as seen from an automobile or pedestrian traveling toward the ballpark. At this location, the Pavilion Building and the back of the infield and mid-field light fixtures



SOURCE: Hellmuth, Obata, & Kassabaum

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Figure IV.C.4 Location 1: Lighting Analysis Viewpoint Looking South: The Embarcadero (Herb Caen Way) at King Street and Pier 40

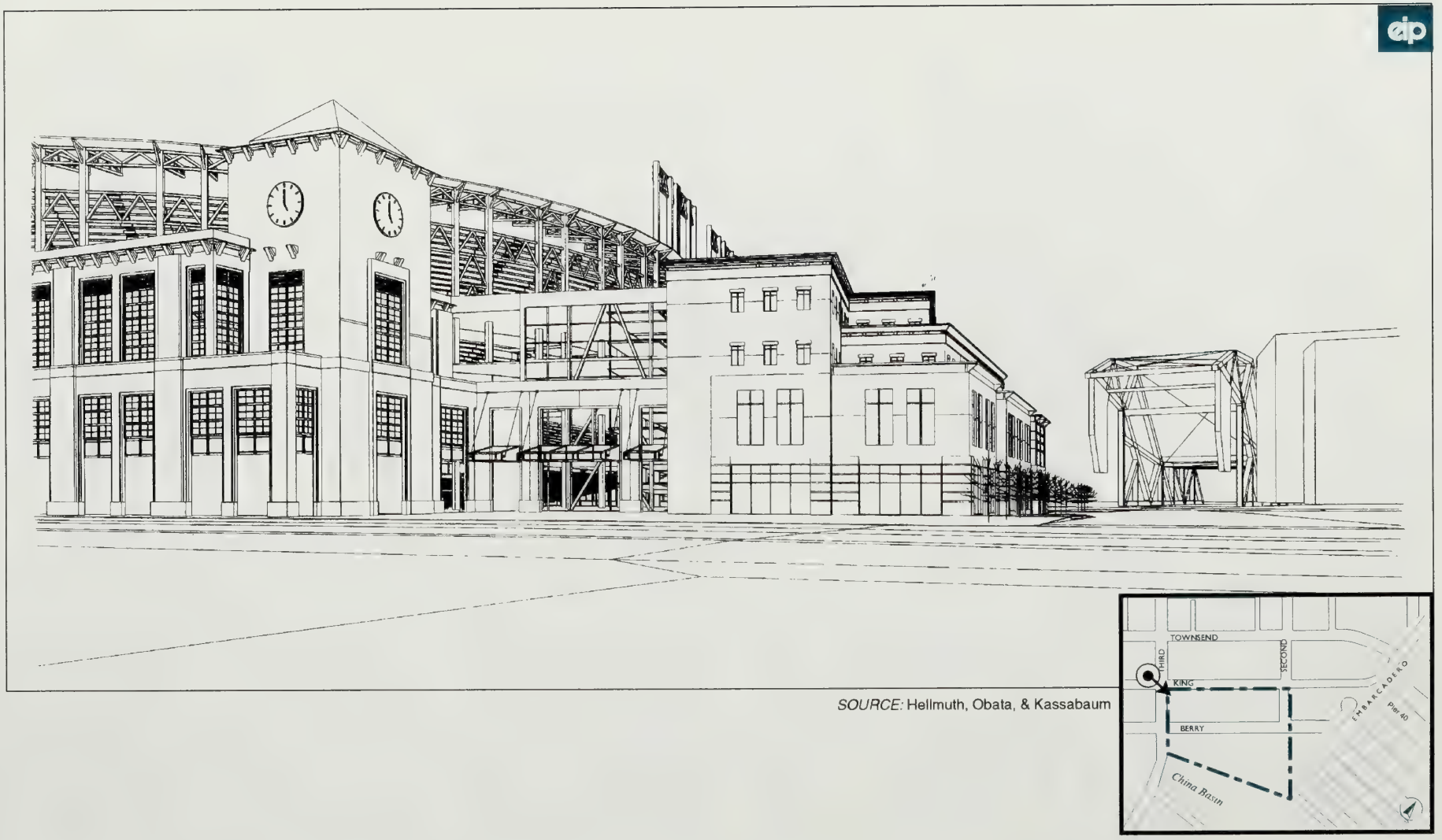
would be visible. Light fixtures at the scoreboard would not be visible because of the intervening building and seating of the ballpark between the viewer and scoreboard (see Figure IV.C.5).

Computer modeling indicates that spill light in horizontal and vertical dimensions would be unobtrusive at less than 0.2 foot-candle. The structure of the ballpark would provide a barrier that would reduce the amount of light leaving the ballpark. In comparison, street lighting and other building lighting would generate about 2.5 foot-candles. The illumination emitting from the lighting fixtures would be seen at their source, but there would be no obtrusive light or glare causing vision impairment. Ballpark lighting would be supplemented by street lights and surrounding buildings during nighttime hours.

Location 3, King and Second Streets

Location 3 is at ground level directly opposite the ballpark site, looking south from Second and King Streets. The distance to the ballpark from this location would be less than 300 ft. The view would be as seen from an automobile or pedestrian traveling near the ballpark. At this location, the back of the left-field light fixtures would be seen. The outfield and right-field banks would not be seen from this location because of the intervening building and seating bowl between the viewer and light fixtures (see Figure IV.C.6, p. IV.40).

Ballpark lighting impacts for Location 3 would be similar to those for Location 2 (at the northwest corner of Third and King Streets). Spill light in horizontal and vertical dimensions would be unobtrusive at less than 0.2 foot-candle. The structure of the ballpark would provide a barrier that reduces the amount of light leaving the ballpark. In comparison, street lighting and other building lighting would generate about 2.5 foot-candles. The illumination emitting from the back of the left-field light fixtures would be seen at their source, but there would be no obtrusive light or glare causing vision impairment. Ballpark lighting would be supplemented by street lights and lights from surrounding buildings during nighttime hours.



SOURCE: Hellmuth, Obata, & Kassabaum

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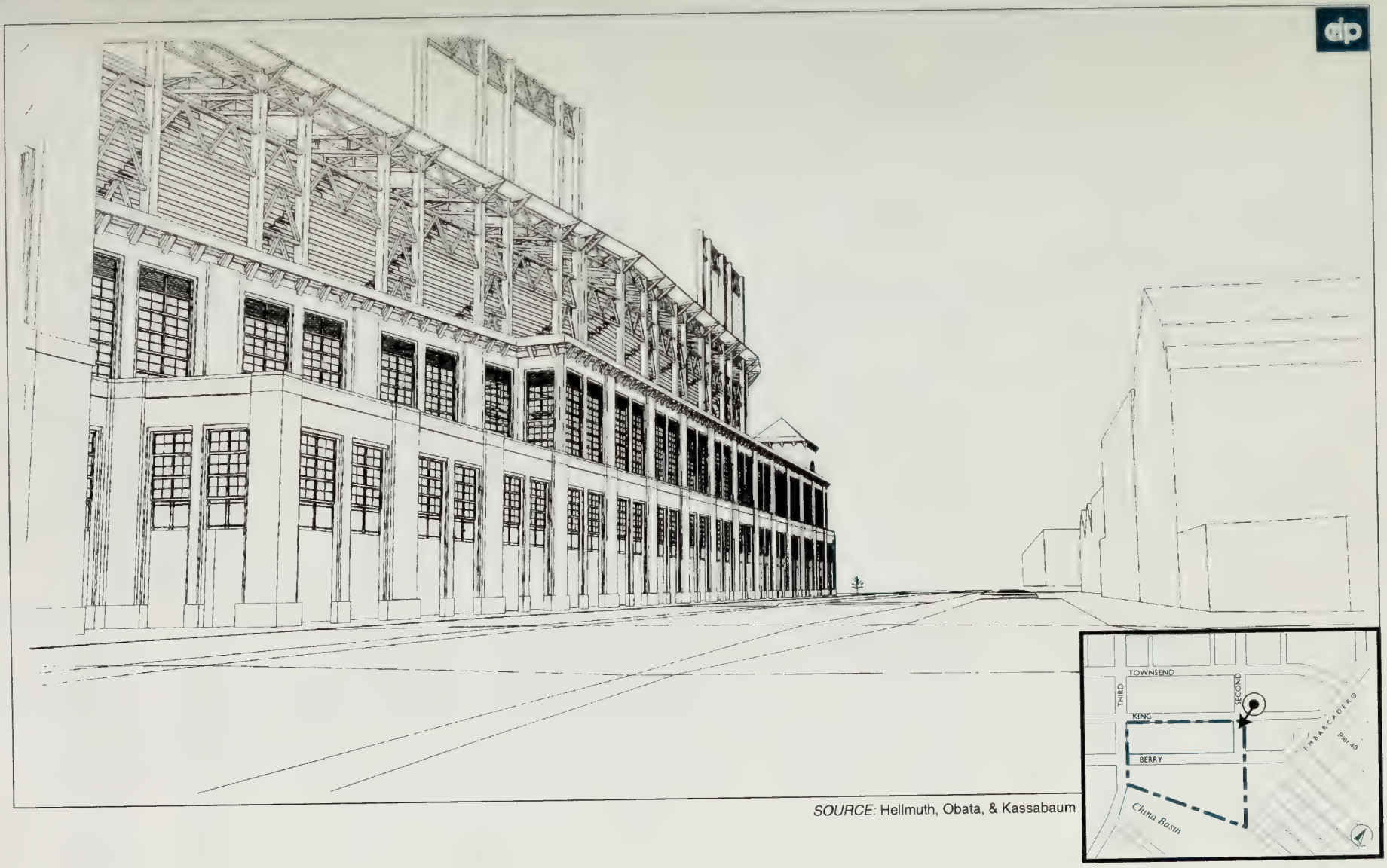
Figure IV.C.5 Location 2: Lighting Analysis Viewpoint Looking Southeast: Third and King Streets



SOURCE: Hellmuth, Obata, & Kassabaum

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Figure IV.C.6 Location 3: Lighting Analysis Viewpoint Looking South: Second and King Streets

Location 4, South Beach Marina Apartments

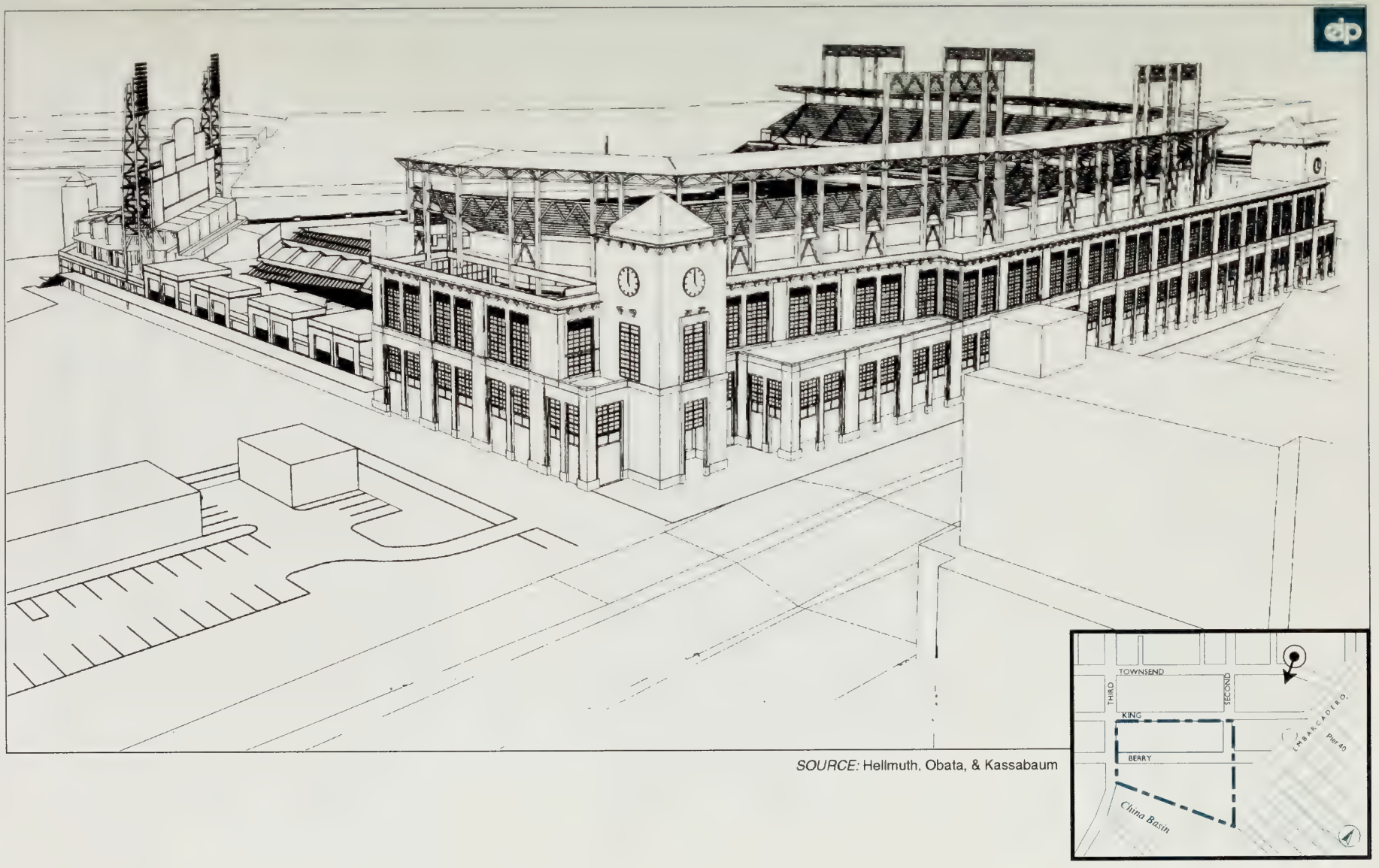
North of the ballpark, residential areas are generally considered to be the most sensitive receptors for light-producing activities, and the residential units at South Beach Marina Apartments, particularly those facing the ballpark, would be among the most directly affected.

Location 4 is approximately 1,500 ft. north of the ballpark site, as viewed from approximately the 12th floor of the residential tower at South Beach Marina Apartments, on Townsend Street west of The Embarcadero, looking south to the ballpark. From this location, the outfield light banks, part of the right-field light banks, the back of the left-field light banks, and the scoreboard would be visible (see Figure IV.C.7).

Location 4 would provide maximum exposure to ballpark lighting of the locations analyzed. Computer modeling indicates that spill light in horizontal and vertical dimensions would be unobtrusive at 0.0 foot-candle. However, the illumination emitting from the lighting fixtures would be seen at their source. Because lighting elements of the outfield and right-field banks would be directly viewable, and because there would be no strong background lighting source (such as a city skyline) to reduce the contrast between the ballpark lighting and ambient lighting, residents could find light and glare emanating from the ballpark to be obtrusive. Thus, residents at this location may experience some annoyance from lighting effects on occasion of nighttime games. This would be a localized, temporary and intermittent effect during the approximately 40 night games per season.

- Location 5, Southwest of the Ballpark

- Location 5 is approximately 4,000 ft. southwest of the ballpark site. From this location at the height of the elevated I-280 freeway structure, the outfield light banks, the left field light



SOURCE: Hellmuth, Obata, & Kassabaum

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Figure IV.C.7 Location 4: Lighting Analysis Viewpoint Looking South: Near First Street Between Townsend and Brannan Streets

banks, the back of the right-field light banks, and the scoreboard would be visible (see Figure IV.C.8). Views of the left-field banks would be screened by the right-field banks. Computer modeling indicates that horizontal and vertical spill light from the ballpark would be unobtrusive at 0.0 foot-candle by about 500 ft. from the southwest of the ballpark. At more distant locations in residential areas of Potrero Hill, spill light values would also be 0.0.

Background lighting from nearby buildings, buildings across the Bay, and the Bay Bridge would serve to reduce the contrast between the ballpark lighting and nighttime darkness. However, the ballpark lighting would be brighter than downtown building and street lighting. For comparison purposes of glare effects, the full moon on a clear night is perceived as bright, but not glaring (staring at the moon does not cause visual discomfort). If the visual impact of the ballpark lighting as would be seen from this location were equal to that of a full bright moon, people could consider the ballpark lighting to be too bright, but not glaring or impairing vision. It would be expected that the visual impact of the proposed ballpark lighting as seen at more distant points from this location, such as on Potrero Hill, would be less than that produced by a full bright moon, or not glaring.

- South Beach Harbor Locations

From locations in South Beach Harbor, from about 100 ft. to 1,200 ft. from the ballpark, the back of the scoreboard and outfield light banks would be visible; parts of the left-field and right-field banks would be visible, depending upon the location in the harbor. Computer modeling indicates that spill light in South Beach Harbor locations would have a maximum vertical value of 5 foot-candles or less. Five foot-candles would be similar to conditions on a street with bright street lighting and light from structures, such as security lighting or retail displays. Near the harbor entrance, the maximum vertical value would be about 0.25 foot-candles. In some locations in the harbor, the right-field light standards would be visible. Computer modeling indicates that spill light in horizontal and vertical dimensions would be unobtrusive to South Beach Harbor at less than 0.2 foot-candles. In comparison, street

lighting and other building lighting would generate about 2.5 foot-candles. The illumination emitting from the lighting fixtures would be seen at their source, but there would be no obtrusive light or glare causing vision impairment. Ballpark lighting would be seen from the harbor with a background of street lights, surrounding buildings, and harbor lighting during nighttime hours.

Improvement Measure

The following improvement measure has been identified to address impacts of the project that would be less than significant.

Prior to opening the ballpark, the project sponsor would test the installed field-lighting system to ensure that lighting met operating requirements in the ballpark, and minimized obtrusive spill lighting in the ballpark vicinity. Testing would include light-meter measurements at selected locations in the ballpark vicinity, to measure spill lighting from ballpark field-lighting fixtures, permit adjustment of lighting fixtures, and confirm that spill-lighting effects would be within the range of Maximum Vertical Values for foot-candles in Figure IV.C.3a of the EIR.

Other Lighting Considerations

Fog or misty rain would create other-than-normal lighting conditions. Fog occurs frequently in San Francisco during nighttime hours throughout the year, particularly in the summer baseball season. Because of the reflective values of water droplets, the sports lighting system would be less effective on the playing field during fog or mist conditions. Ballpark light would be diminished or lost to the immediate environment within the seating bowl and would create a glowing condition above the seating bowl because of reflectance by the water droplets. This glowing condition would normally be located below the height of the lighting racks and would not result in increases in spill light. The glowing condition would be visible from locations that would normally view the ballpark under fog-free conditions, but the reflected light would be less intense than under fog-free conditions.

SOURCE: Hellmuth, Obata, & Kassabaum

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● **Figure IV.C.8 Location 5: Lighting Analysis Viewpoint Southwest of Project Site**

Proposed Parking Areas

The proposed project includes development of paved parking areas, totaling about 40 acres for approximately 5,000 vehicles south of China Basin Channel (see Figure II.D.5 p. II.20, for location of parking areas). The parking areas would contain lighting fixtures. Presently these proposed parking areas are under-developed with minimal light sources. The lighting fixtures for the parking areas have not been designed. As with ballpark lighting, background lighting from nearby buildings, buildings across the Bay, and the Bay Bridge would serve to reduce the contrast between the parking area lighting and nighttime darkness. It would be expected that the visual impact of the proposed parking area lighting as seen from Potrero Hill could appear similar to street lighting. However, the parking lighting would be more concentrated than street lighting.

Because the parking lighting has not yet been designed, it is possible that light levels from the parking areas could be seen as glaring from residential areas on the north and east slopes of Potrero Hill. The project would include a mitigation measure to provide adequate lighting in the parking areas for patron visibility and safety, and to minimize spill lighting or glare in off-site areas.

NOTES - Visual Quality and Lighting

1. The photograph was taken from the roof of Patrick Henry School, 639 Vermont Street near Eighteenth Street, to provide an unobstructed view of the project area. Although the viewpoint is not publicly accessible, it is similar to views partially available from streets and residences on Potrero Hill.

2. The lighting discussion is based on M-E Engineers, *Summary Report for San Francisco Environmental Lighting*, January 1997. A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

D. SHADOWS AND WIND

SHADOWS

The ballpark site is within an area of docks, warehouses and related uses. The existing warehouse and Pier 46B buildings on the site and other neighboring buildings cast shadows on streets and sidewalks on the project site and in the project vicinity.

The ballpark would be approximately 90 feet (ft.) high to the top of the street wall and approximately 130 ft. high to the top of seating bowl. The light structures would reach up to approximately 175 ft. high. The new structure would cast new shadows on sidewalks, streets and open spaces near the project site.

Open space uses existing or proposed in the vicinity of the project include: South Beach Harbor, South Beach Park and its proposed extension, and the Promenade, to the east of the project site; and South Park, about three blocks to the northwest between Brannan, Bryant, Second and Third Streets. South Park is under the jurisdiction of the San Francisco Recreation and Park Department. The open spaces on the waterfront are not under the jurisdiction of the Recreation and Park Commission and therefore not subject to the shadow restrictions of City Planning Code Section 295 (the Sunlight Ordinance). The existing South Beach Park encompasses 5.3 acres; the proposed extension of South Beach Park would cover an area of about 3.7 acres and would include lawns, walkways, and a promenade along the Bay. Preliminary plans for the extension of South Beach Park include a change in grade upslope of about 14 ft. from the South Beach Harbor shoreline to the walkway on the east side of the ballpark. (In this section, "South Beach Park" refers to both the existing area and the proposed extension of the park.)

New development over 40 ft. in height which would cast shadows on South Park would be subject to Section 295. Section 295 would prohibit the issuance of a building permit for a structure that would shadow South Park any time of the year between one hour after sunrise

and one hour before sunset, unless the Planning Commission, in consultation with the Recreation and Park Commission, determines that such shadow would have an insignificant adverse impact on the use of such property. The project site is more than 1,000 ft. from South Park and the top of the ballpark structure would be about 130 ft. high; the shadow from the project would not reach South Park or any other Recreation and Park space during the times covered by Section 295.

Currently, pedestrian traffic in the project area is light. Increases in pedestrian use can be expected to result from the construction of the proposed extension of South Beach Park. Given the substantial pedestrian traffic that would be expected in the area with the ballpark, this analysis examines afternoons, when the most pedestrians are likely to be in the area and affected by shadow. The times selected for analysis are 12:00 p.m., 3:00 p.m. and 5:00 p.m., Pacific Standard Time (PST) in March and December, and Pacific Daylight Time in June and September.

As described below, existing shadowing of the streets and vacant lands on the site is similar in pattern and extent to that from the buildings on the north side of King Street. Only in a few instances for the times analyzed would the shadow from the existing buildings extend beyond the project site itself. To more clearly illustrate the new shadow from the project, the existing shadows are not shown on the project shadow diagrams.

December 21

At noon, December 21, shadows from the project would reach across King Street, with new shadow covering most of the street between Third Street and Second Street and extending about 130 ft. beyond the Second Street intersection (see Figure IV.D.1). Shadow would cover about 400 ft. of sidewalk on the north side of King Street and about 1,000 ft. on the south side of King Street. Most of the existing shadow from the warehouses fronting Berry Street does not reach King Street at noon.

SOURCE: Environmental Science Associates

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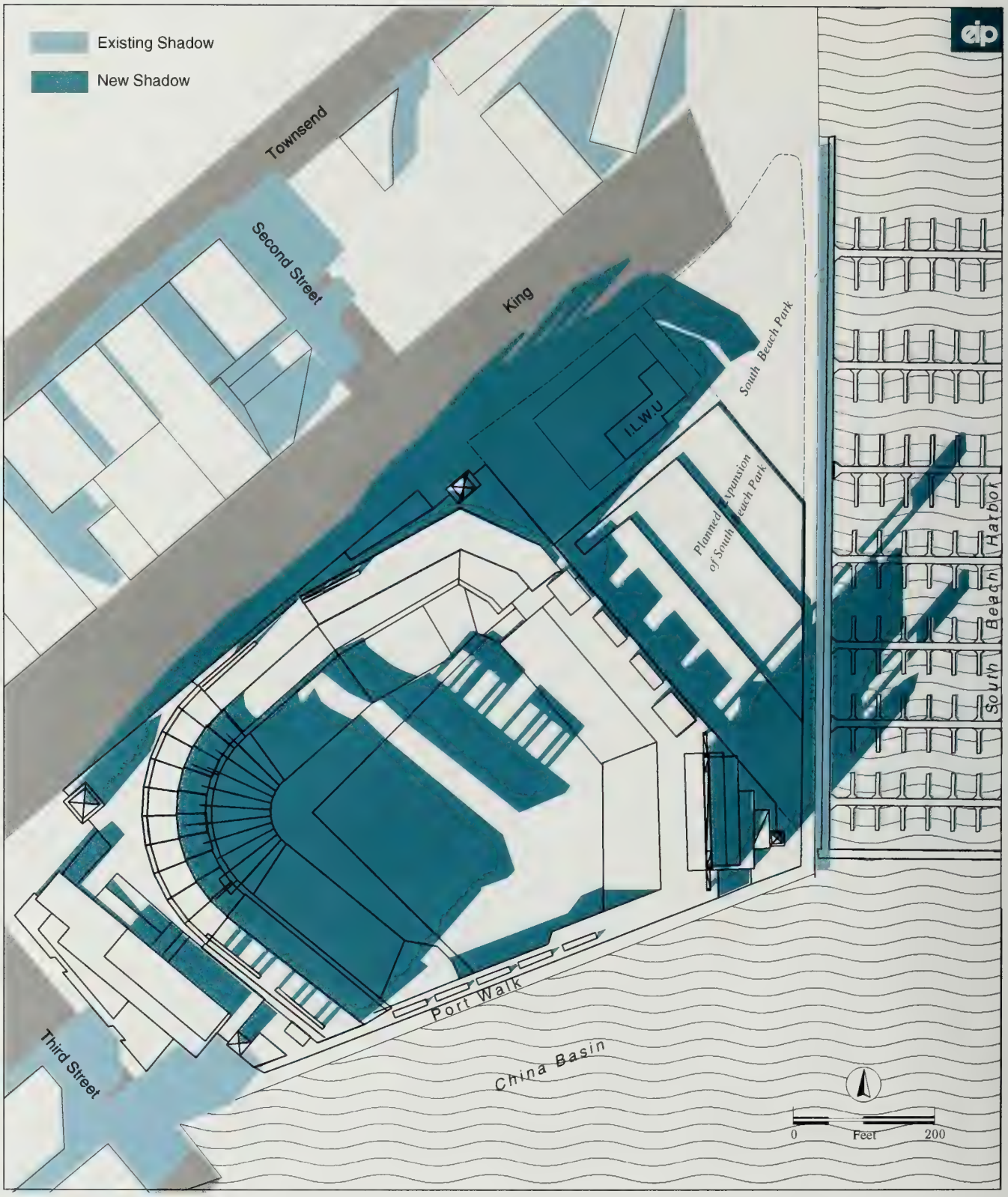
Figure IV.D.1 Project Shadows December 21, 12:00 Noon PST

The project would not shade the proposed Port Walk fronting China Basin. The existing China Basin Building and China Basin Landing Building cast shadow on the street and sidewalks of Third Street between China Basin and Berry Street, and the project would add no new shadow at noon. The ballpark structure would cast new shadow less than 25 ft. into the South Beach Park extension. The restaurant component of the ballpark and centerfield scoreboard would cast new shadow in the park about 200 ft. toward, but not reaching the International Longshoremen Workers Union (ILWU) building. New shadow would not reach the existing area of South Beach Park.

In total, the new shadow would cover about 10 percent of the combined area of South Beach Park and the proposed extension.

By 3:00 p.m., shadows from the project would have moved toward the east, nearly reaching The Embarcadero Promenade, with new shadow covering less than half the width of King Street and shadowing about 1,100 ft. of the south sidewalk of King Street between Third Street and The Embarcadero (see Figure IV.D.2). The project would not shadow the Port Walk fronting China Basin. Existing shadow from the warehouses fronting Berry Street does not now reach much beyond Second Street at this time. The existing China Basin Building and China Basin Landing Building cast shadow on the street and sidewalks of Third Street between China Basin and Berry Street, and the project would add no new shadow at 3:00 p.m. The project would cast new shadow about 80 ft. into the extension of South Beach Park, covering about 0.1 acre adjacent to the ballpark. The project's grandstands would fully shadow the ILWU Building and its parking lot, and about 0.5 acre of existing South Beach Park east of the ILWU Building. The restaurant and centerfield scoreboard would cast new shadow that would cover about 0.3 acre of the proposed extension of South Beach Park. The shading from the scoreboard and light standards would extend about 200 ft. into South Beach Harbor, shading parts of piers and boat slips, and open water areas. In total, the new shadow would cover less than 15 percent of the area of South Beach Park.

By 5:00 p.m., December 21, the sun has set. No shadow diagram is provided.



SOURCE: Environmental Science Associates

GIANTS BALLPARK

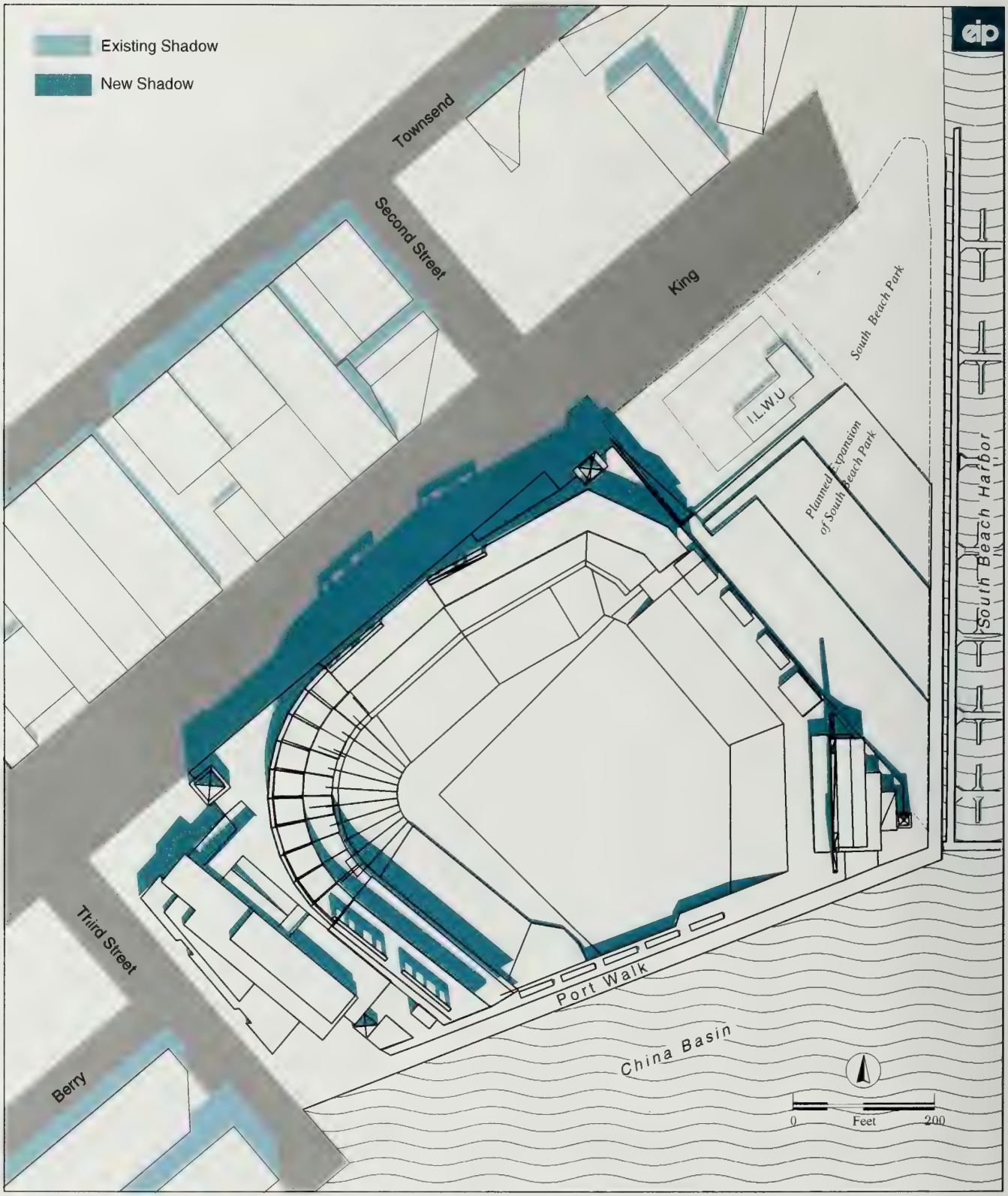
● Figure IV.D.2 Project Shadows December 21, 3:00 P.M. PST

March 21

At noon on March 21, shadows from the project would reach about halfway across King Street, with new shadow covering about 900 ft. of the south sidewalk of King Street between Third Street and extending 50 ft. beyond the Second Street intersection (see Figure IV.D.3). The project would not shadow the proposed Port Walk fronting China Basin. Existing shadows from the warehouses on the site fronting Berry Street do not reach the King Street sidewalk at this time. The existing China Basin and China Basin Landing Buildings cast shadows on the street and west sidewalks of Third Street between China Basin and Berry Street, while the project would add no new shadow at noon. The project would cast new shadow about 10 ft. into the extension of South Beach Park; the restaurant and center-field scoreboard would cast new shadow about 60 ft. into South Beach Park, toward the ILWU Building; project shadow would be less than 0.1 acre, about 3 percent of South Beach Park.

By 3:00 p.m., project shadows would have moved east off King Street (see Figure IV.D.4, p. IV.53). Existing shadow from the warehouses fronting Berry Street does not reach King Street and does not cross Second Street. The existing China Basin and China Basin Landing Buildings cast shadow on the west sidewalks and pavement of Third Street between China Basin and Berry Street; the project would add no new shadow there at 3:00 p.m. The project would not shade the proposed Port Walk fronting China Basin. The bleacher concourse area would cast new shadow less than 30 ft. into South Beach Park, covering less than 0.3 acre. The project would shade about half of the ILWU parking lot, and the upper seating, restaurant and center-field scoreboard would cast new shadow that would reach about 150 ft. into the extension of South Beach Park and cover about 0.3 acre. In total, the new shadewould cover about 20 percent of the total area of the park. New shadow would not reach the existing area of South Beach Park. The light standards would shade an area about 30 ft. into South Beach Harbor.

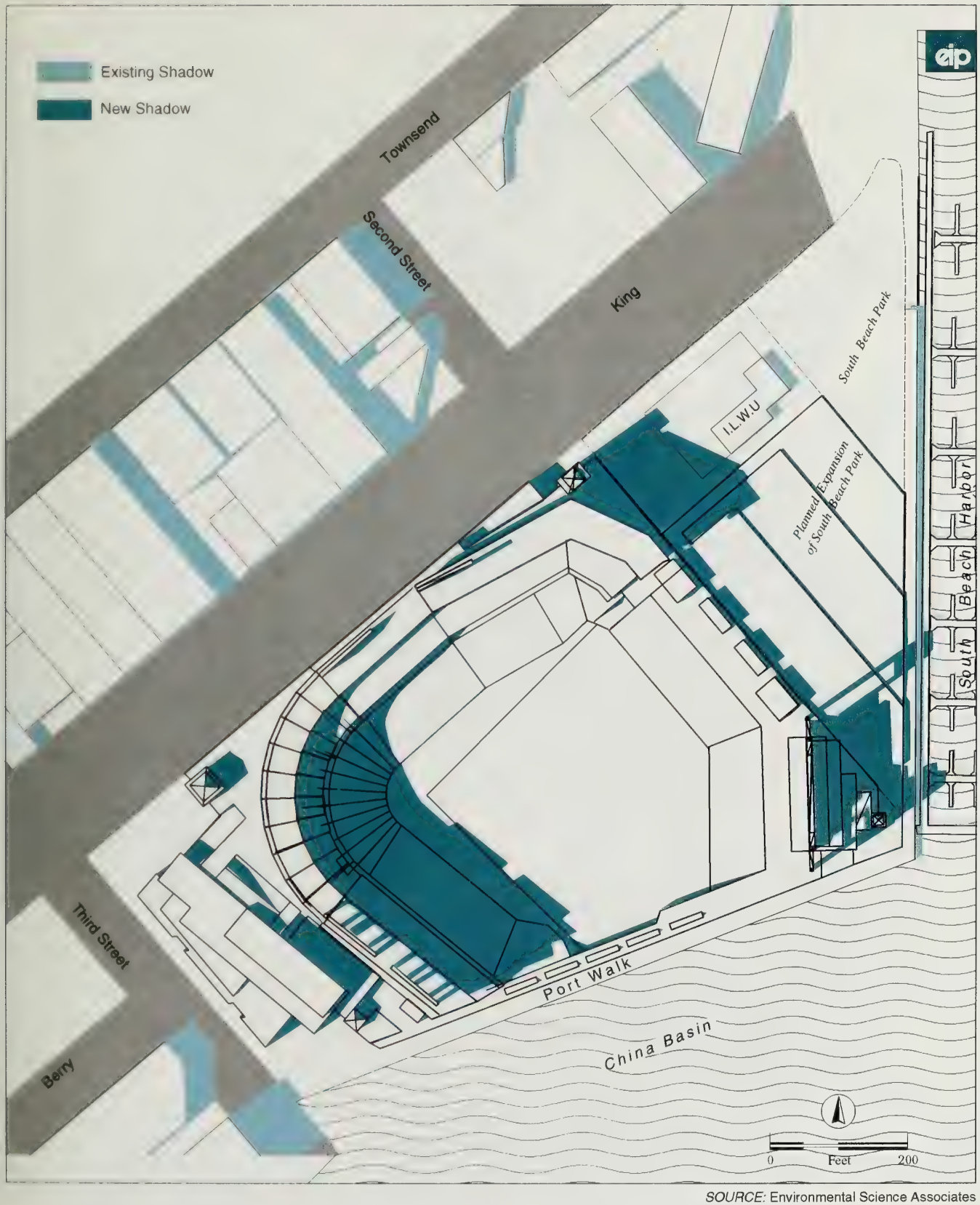
By 5:00 p.m., existing shadows from the buildings on the north side of King Street presently cover portions of King Street between Third and Second Streets, and cover all of Second Street to the east. The existing China Basin and China Basin Landing Buildings cast shadow on the street and sidewalks of Third Street between China Basin and Berry Street (see Figure IV.D.5, p. IV.54).



SOURCE: Environmental Science Associates

GIANTS BALLPARK

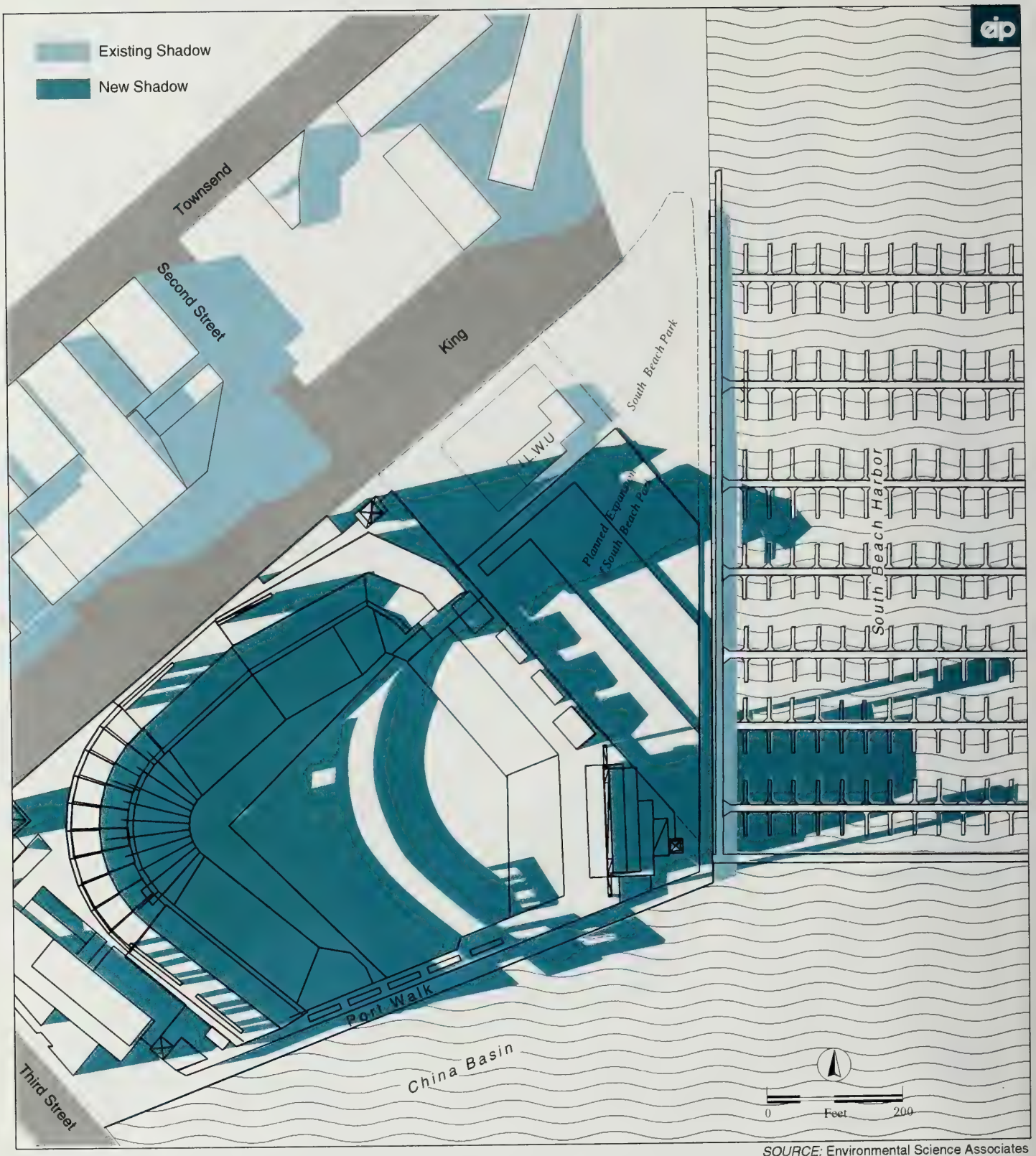
Figure IV.D.3 Project Shadows March 21, 12:00 Noon PST



SOURCE: Environmental Science Associates

GIANTS BALLPARK

● **Figure IV.D.4 Project Shadows March 21, 3:00 P.M. PST**



SOURCE: Environmental Science Associates

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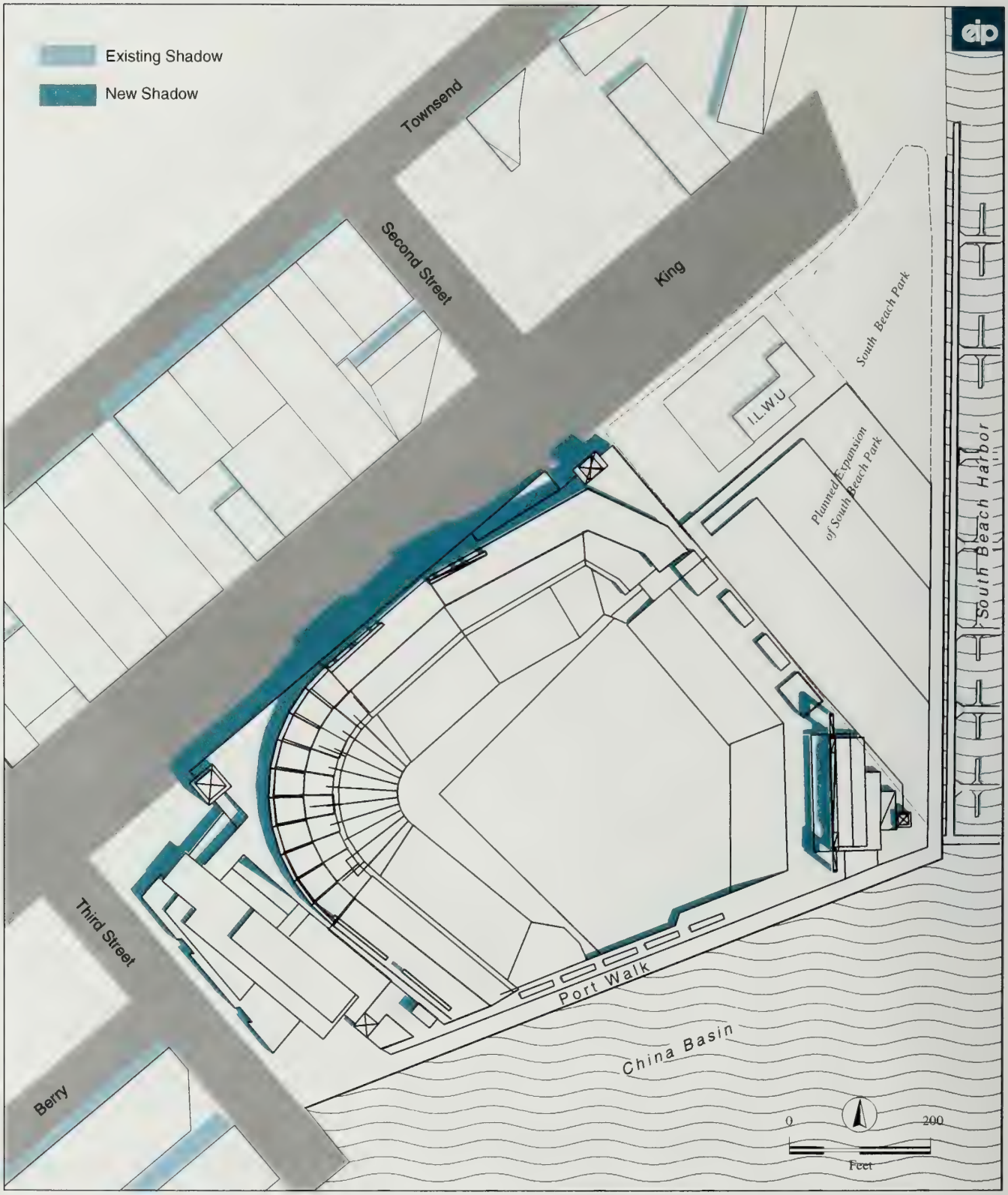
● Figure IV.D.5 Project Shadows March 21, 5:00 P.M. PST

The project would add no new shadow there at 5:00 p.m. The project would shade about half of the area of the Port Walk fronting China Basin with most of the width of the walk in shade. The project would shade the southern portion of the ILWU parking lot and about 1.6 acres of the southern portion of South Beach Park, reaching into the existing area of South Beach Park. In total, the new project shadow would cover about half of South Beach Park. The scoreboard and light standards would shade South Beach Harbor, extending up to 400 ft. into the harbor. The ballpark seating bowl would shade an area about 100 ft. into the harbor.

June 21st

At noon, Pacific Daylight Time (PDT), June 21st, project shadows would reach north about one-third or less across King Street, with new shadow covering less than 800 ft. of the south sidewalk of King Street between Third Street and the Second Street intersection (see Figure IV.D.6). Existing shadows from the warehouses fronting Berry Street do not reach the King Street sidewalk at this time. The existing China Basin and China Basin Landing Buildings cast shadow on the street and sidewalks of Third Street between China Basin and Berry Street, while the project would add no new shadow there at noon. The project would not shadow the Port Walk fronting China Basin, nor would it shadow any portion of the existing or proposed extension of South Beach Park.

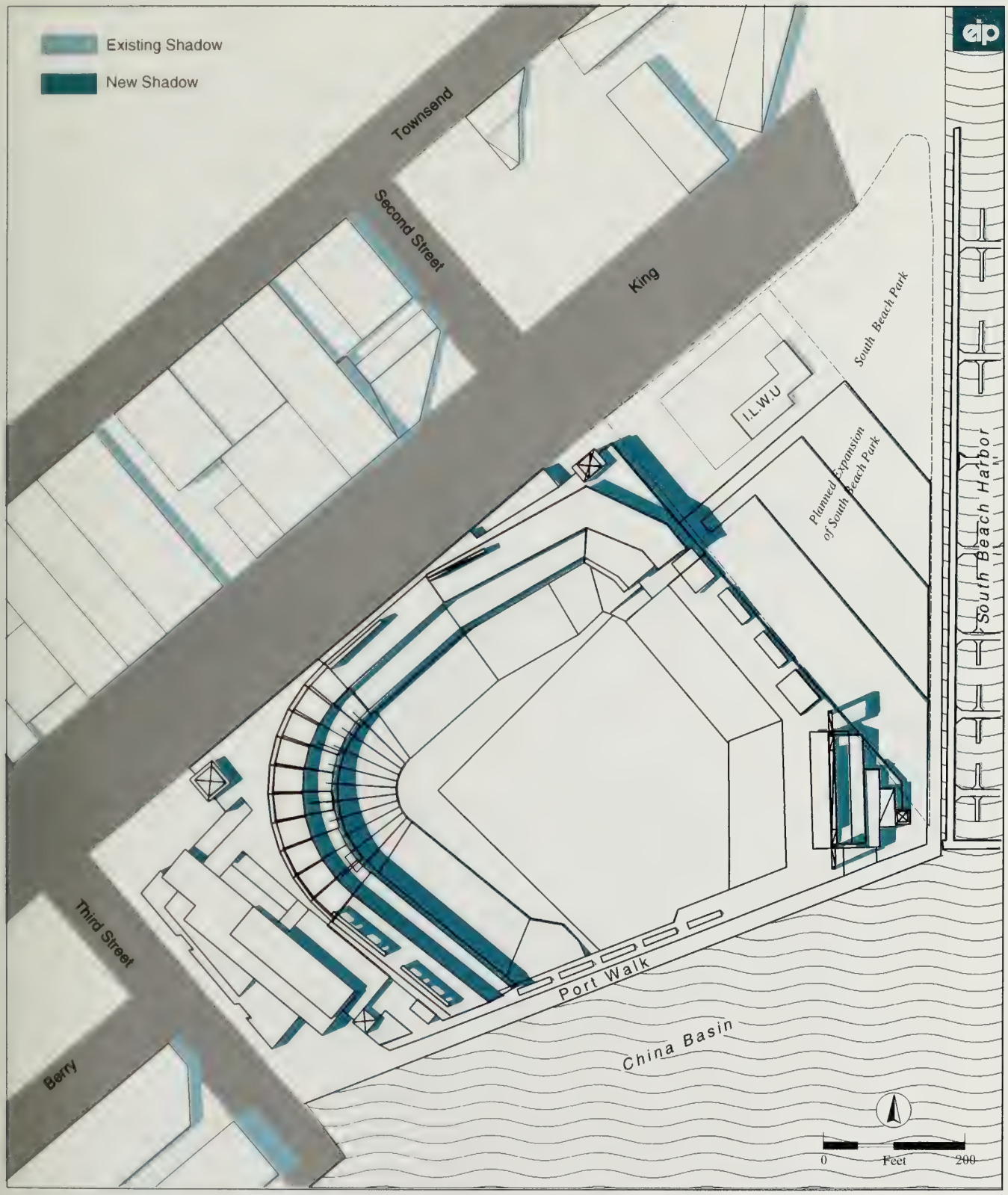
By 3:00 p.m., PDT, project shadows would not reach King Street. Existing shadows from the warehouses fronting Berry Street do not reach King Street; they shade portions of Second Street (see Figure IV.D.7, p. IV.57). The existing China Basin and China Basin Landing Buildings cast shadow on the street and sidewalks of Third Street between China Basin and Berry Street. The project would not add shadow on Third Street at 3:00 p.m. The project would not shade the Port Walk fronting China Basin at that time. The bleacher concourse structures would cast new shadow less than 20 ft. into the extension of South Beach Park. The grandstands would not shade the ILWU parking lot. The restaurant and centerfield scoreboard would shade up to 60 ft. into the extension of South Beach Park. In total, the new shadow would cover less than 5 percent of South Beach Park and its proposed extension combined. New shadow would not reach the existing area of South Beach Park.



SOURCE: Environmental Science Associates

GIANTS BALLPARK

Figure IV.D.6 Project Shadows June 21, 12:00 Noon PDT



SOURCE: Environmental Science Associates

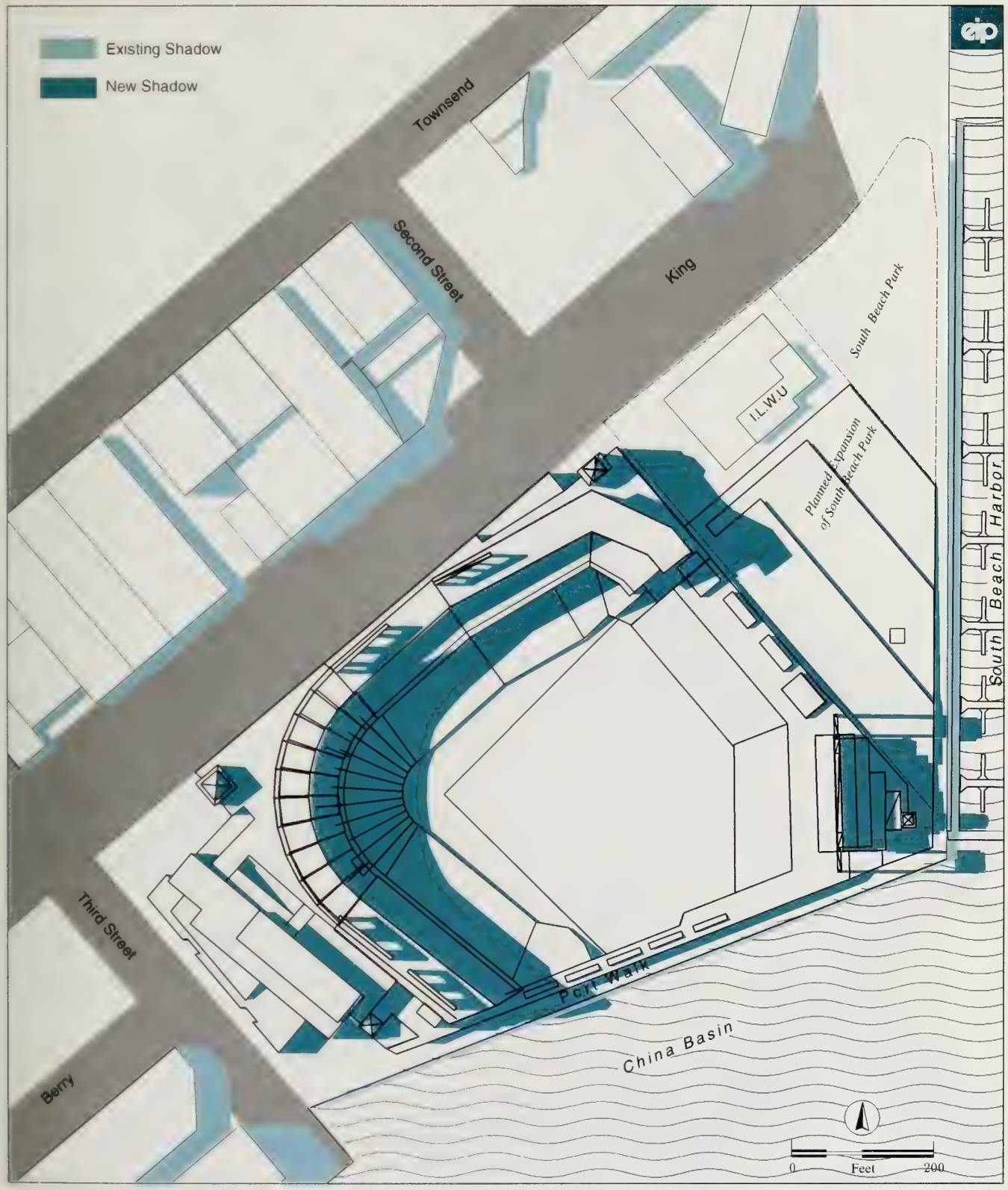
GIANTS BALLPARK

Figure IV.D.7 Project Shadows June 21, 3:00 P.M. PDT

By 5:00 p.m., PDT, project shadows would have moved farther east; the ballpark would not shade King Street (see Figure IV.D.8). Existing shadows from the buildings on the north side of King Street cover small portions of King Street east of Third Street. The existing China Basin and China Basin Landing Buildings cast shadow on the street and sidewalks of Third Street between China Basin and Berry Street; the project would not add shade there at 5:00 p.m. The project would shade about half of the width of the Port Walk fronting China Basin for about 500 ft. and would cover the full width of a 150 ft. portion of the walk. The grandstands would add shade about 90 ft. into the extension of South Beach Park; the shade would not reach the ILWU Building or most of the ILWU parking lot. The restaurant and center-field scoreboard would shade the southern tip of South Beach Park. In total, the project would shade about 25 percent of South Beach Park and its proposed extension combined. New shadow would not reach the existing area of South Beach Park. The centerfield scoreboard and light standards would shade about 40 ft. into South Beach Harbor.

September 21

At noon, September 21, PDT, project shadows would reach about three-quarters of the way across King Street, with new shade on about 800 ft. or less of the south sidewalk of King Street between Third Street and the Second Street intersection (see Figure IV.D.9, p. IV.60). The project would not shade the proposed Port Walk fronting China Basin. Existing shade from the warehouses on the project site fronting Berry Street does not reach King Street at this time. The existing China Basin and China Basin Landing Buildings cast shadow on the street and sidewalks of Third Street between China Basin and Berry Street, while the project would add no new shadow at noon. The project would cast new shadow less than 10 ft. into the proposed extension of South Beach Park. The restaurant and center-field scoreboard would shade about 20 ft. into the extension of South Beach Park. The project would shade less than 5 percent of South Beach Park with its proposed extension combined. New shadow would not reach the existing area of South Beach Park.



SOURCE: Environmental Science Associates

GIANTS BALLPARK

● Figure IV.D.8 Project Shadows June 21, 5:00 P.M. PDT

SOURCE: Environmental Science Associates

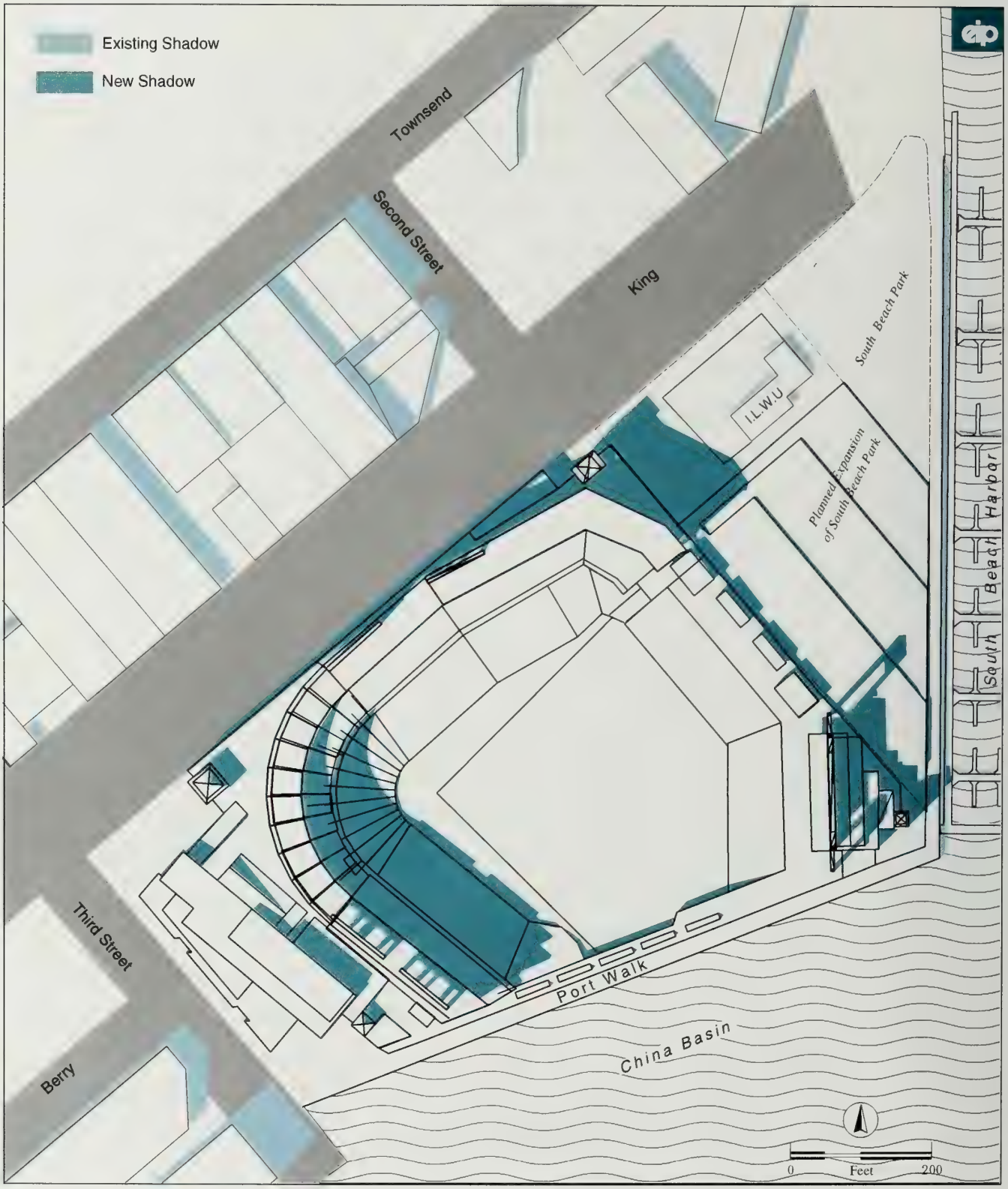
GIANTS BALLPARK

Figure IV.D.9 Project Shadows September 21, 12:00 Noon PDT

By 3:00 p.m., the project would shade about 700 ft. of the south sidewalk of King Street (see Figure IV.D.10). The project would not shade the proposed Port Walk fronting China Basin. Shadows from the existing warehouses fronting Berry Street do not reach King Street and cover part of Second Street. The existing China Basin and China Basin Landing Buildings cast shadows on the street and west sidewalk of Third Street between China Basin and Berry Street; the project would add no new shadow there at 3:00 p.m. The project would cast new shadow less than 30 ft. into the extension of South Beach Park. It would shade less than half of the ILWU parking lot, and would not shade the ILWU Building. The restaurant and centerfield scoreboard would shade up to about 160 ft. into South Beach Park, covering about 0.3 acre. The project would shade less than 10 percent of South Beach Park and its proposed extension. New shadow would not reach the existing area of South Beach Park. The centerfield restaurant structure would shade about a 30 ft. length of the South Beach Harbor wharf adjacent to the proposed extension of South Beach Park.

By 5:00 p.m., project shadows would not shade King Street (see Figure IV.D.11, p. IV.63). Existing shadows from the buildings on the north side of King Street cover portions of King Street east of Third Street. The existing China Basin and China Basin Landing Buildings cast shadows on the street and sidewalks of Third Street between China Basin and Berry Street; the project would add no new shadow. The project would cast shade on part of the proposed Port Walk fronting China Basin. New shade would cover about one-quarter of the ILWU parking lot, but not the ILWU Building. New shade would reach up to 250 ft. into the extension of South Beach Park, covering about 1 acre. The restaurant and centerfield scoreboard would cast new shadow that would reach across to the Bay, covering about 0.3 acre of the proposed South Beach Park extension. The project would shadow about one-third of the total area of South Beach Park and its proposed extension combined, but new shadow would not reach the existing area of South Beach Park. The scoreboard and light standards would shade about 200 ft. into South Beach Harbor, shading parts of piers, boat slips and open water areas.

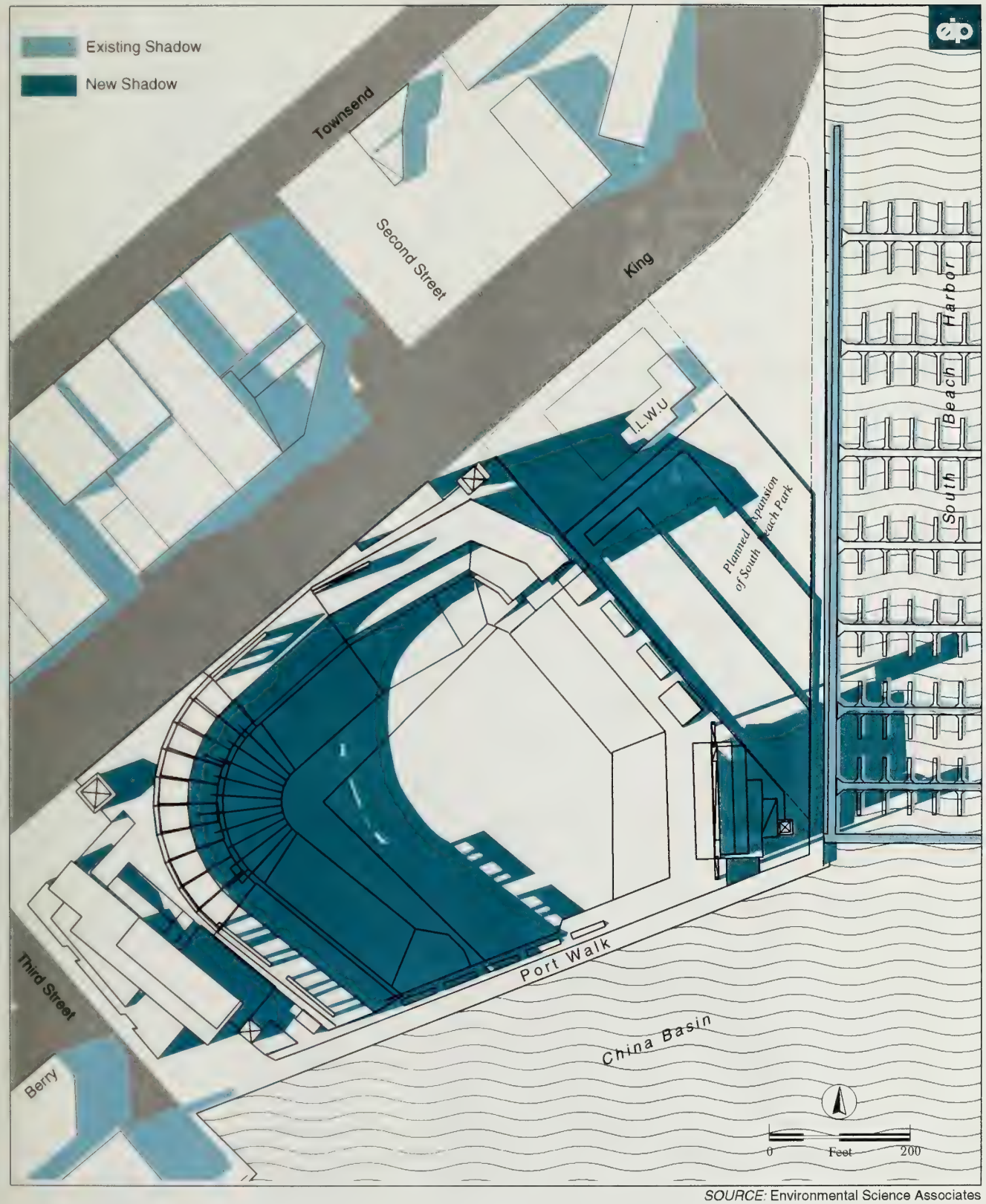
In summary, the project would shade about 20 percent or less of adjacent existing and proposed park space in the time period studied, except at 5 p.m. in spring and fall. At those times, the project would shade about 33 percent to 50 percent. The existing South Beach Park, and its



SOURCE: Environmental Science Associates

GIANTS BALLPARK

● **Figure IV.D.10 Project Shadows September 21, 3:00 P.M. PDT**



SOURCE: Environmental Science Associates

GIANTS BALLPARK

● Figure IV.D.11 Project Shadows September 21, 5:00 P.M. PDT

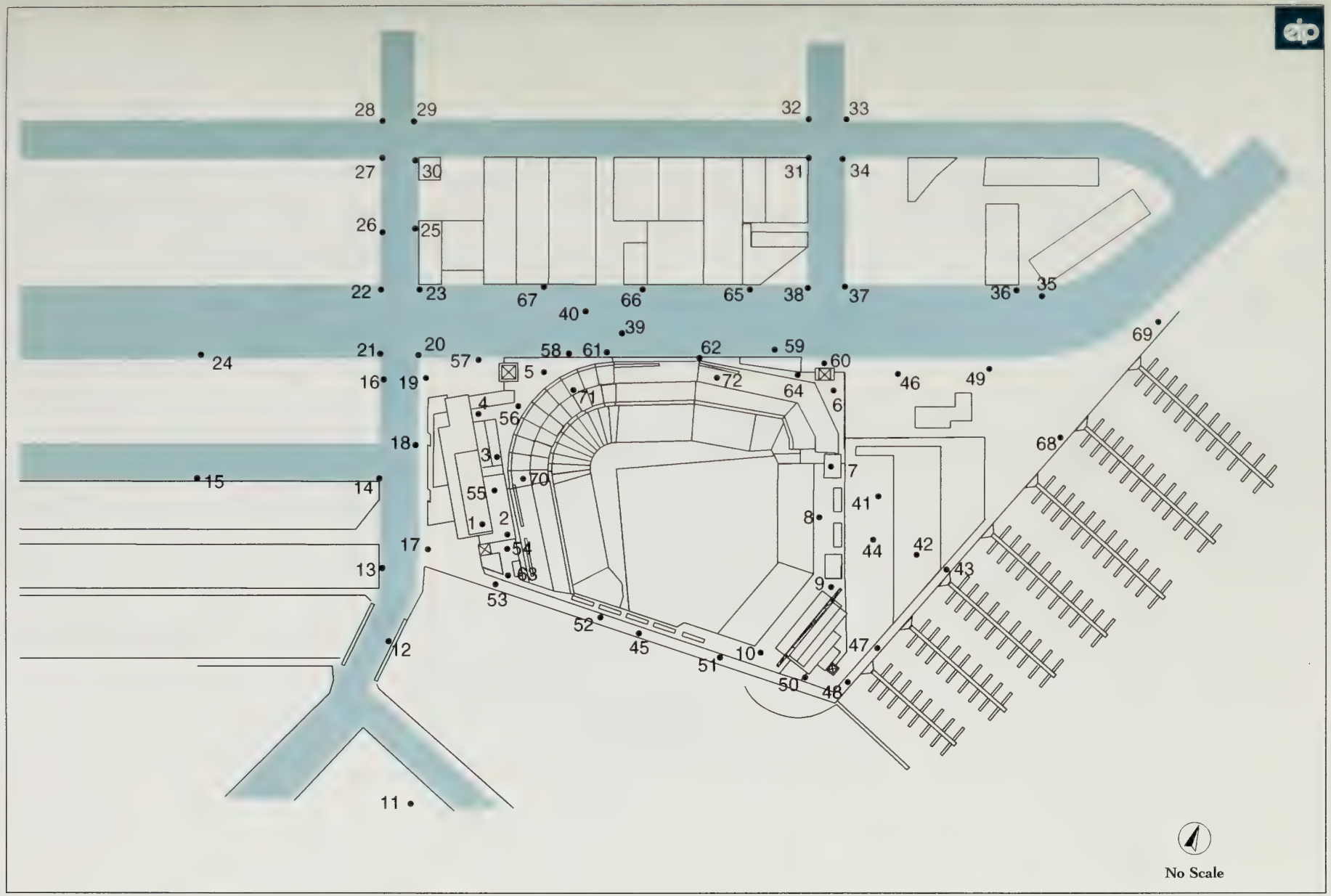
proposed extension are not subject to City Planning Code Section 295, the Sunlight Ordinance, and those shadow effects would not be considered significant.

WIND[1]

The proposed ballpark site is not located within a use district for which the City Planning Code has established wind speed criteria. For purposes of analysis, this EIR uses the wind speed criteria for pedestrian comfort and hazardous winds established in the City Planning Code for the C-3 District: the 11 mph pedestrian comfort criterion, and the hazard criterion in the City Planning Code.

Wind-tunnel tests were conducted for the setting in its existing condition; the ballpark in the existing setting (existing-plus-project); the ballpark configuration; and the ballpark and potential cumulative development in the existing setting (project plus the Mission Bay North of Channel proposal). The wind tunnel testing followed City Planning Code Section 148 methodology, with adjustments to account for the wind speed profile at the project site (see Appendix B, Wind). Forty-six test locations were studied for each of these three scenarios for the four prescribed wind directions: northwest, west-northwest, west, and southwest. These winds are the most common in San Francisco, and are therefore the most representative for evaluation of the proposed project. To the extent possible, all measurements were taken at the same series of surface points around the project site for all test configurations and wind directions included in testing. Measurements at 23 additional project-specific, pedestrian-accessible test locations within or near the proposed ballpark were used to study differences between the alternative configurations.

None of the 69 test locations correspond to representative potential outdoor seating locations; all test locations, including those in the proposed South Beach Park, are considered to be pedestrian areas, rather than sitting areas. See Figure IV.D.12 for locations of the test points. Appendix B, Wind, Figure X.B.1, p. A.64, also identifies the measurement point



SOURCE: Environmental Science Associates

GIANTS BALLPARK

Figure IV.D.12 Wind Test Point Location Plan

locations, and Appendix Tables X.B.1 and X.B.2, pp. A.66 - A.71 summarize the wind-tunnel study results and evaluate compliance with the comfort and hazard criteria.[2] Throughout the following discussion the wind speeds reported refer to the equivalent wind speeds that would be exceeded 10 percent of the time for the pedestrian comfort criterion and one hour per year when referring to the hazard criterion.

Existing Wind Environment

In the existing wind environment in the site vicinity, 39 of the 46 primary test locations now exceed the 11-mph pedestrian-comfort criterion. Wind speeds in pedestrian areas range from 5 mph to 19 mph. Winds are 11 mph or less at 7 of the 46 locations, and are 18 mph or 19 mph at 12 of the 46 locations.

The comfort of pedestrians varies under different conditions of sun exposure, temperature, clothing, and wind speed. Winds up to 4 mph have no noticeable effect on pedestrian comfort. With winds from 4 to 8 mph, wind is felt on the face. Winds from 8 to 13 mph will disturb hair, cause clothing to flap, and extend a light flag mounted on a pole. Winds from 13 to 19 mph will raise loose paper, dust and dry soil, and will disarrange hair. For winds from 19 to 26 mph, the force of the wind will be felt on the body. With 26 to 34 mph winds, umbrellas are used with difficulty, hair is blown straight, there is difficulty in walking steadily, and wind noise is unpleasant. Winds over 34 mph increase difficulty with balance and gusts can blow people over. In general, wind conditions in the vicinity of the site may be attributed to the open nature of the area and resulting lack of wind protection provided by buildings or many trees.

Hazard Conditions

The wind hazard criterion is currently exceeded at 2 of the 46 locations tested. The total duration of all of the existing hazard exceedances is about 18 hours per year. Hazard conditions occur on King Street mid-block between Second Street and The Embarcadero (about 2 hours per year) and at the south end of the proposed South Beach Park extension (about 15 hours per year). The locations of these points as shown on Figure IV.D.12, p. IV.65) are No. 36 and No. 47, respectively.

Project Impacts

The project would reduce existing wind speeds at 30 of the 46 test locations, leave them unchanged at 12 locations and increase speeds at 4 locations. Among the 46 locations, the project would add two new pedestrian wind comfort criterion exceedances and would eliminate six existing exceedances, for a net total of 35 out of the 46 locations. The pedestrian wind criterion would be exceeded at 15 of the 23 additional project-specific locations within the ballpark site. Wind analysis was not performed inside the ballpark in the seating areas for this EIR. The ballpark itself has been oriented to reduce winds in seating areas, based on previous wind studies. Overall, the pedestrian wind criterion would be exceeded at 50 of the total of 69 pedestrian locations.

South of the China Basin Channel, wind speeds in the center of the parking area would decrease by 1 mph to 17 mph. Along Third Street on the Lefty O'Doul Bridge and adjacent to the China Basin Building, wind speeds would remain unchanged, at 6 mph and 7 mph, respectively. At two locations on Berry Street, wind speeds would decrease by 6 mph and 1 mph, to 11 mph and 12 mph. Three of these five locations would meet the pedestrian comfort criterion.

Wind speeds would decrease at 9 of 12 locations along Third Street from Berry Street to Townsend Street, with an average decrease of about 2 mph for these 12 locations. Wind speeds mid-block on Third Street between King and Berry Streets and at all corners of the intersection of Third and King Streets would range from 11 mph to 19 mph. More northerly along Third Street, wind speeds mid-block between King and Townsend Streets would be reduced to 12 mph and 15 mph, and winds at the intersection of Third and Townsend Streets would range from 11 mph to 14 mph. Two of these 12 locations would meet the pedestrian comfort criterion.

At the Second Street and King Street intersection, wind speeds would decrease by an average 1 mph, and would range from 12 mph to 17 mph. More northerly along Second Street, wind speeds at the intersection of Second Street and Townsend Street would decrease by an average of 1 mph, and would range from 8 mph to 14 mph. One of these eight locations would meet the pedestrian comfort criterion.

Wind speeds on King Street generally would decrease. Wind speeds would decrease by about 1 mph to a speed of 17 mph mid-block between Fourth and Third Streets, decrease by an average of 2 mph at seven locations mid-block between Third and Second Streets to a range of 9 mph to 14 mph, and remain unchanged at 16 mph at two mid-block locations between Second Street and The Embarcadero. Winds at two of these 10 locations would meet the pedestrian comfort criterion.

Near The Embarcadero, wind speeds would increase by 1 mph to a speed of 6 mph on the north side of King Street and decrease by 1 mph to a speed of 12 mph on the south side, near Pier 40. The first location would meet the pedestrian comfort criterion.

Wind speeds at three South Beach Park locations within the proposed expansion area, and at two locations on the existing South Beach Harbor waterfront would range from 9 mph to 15 mph, representing decreases ranging from 3 mph to 7 mph. Wind speed further north at

South Beach Harbor, near existing South Beach Park, would remain unchanged at 17 mph. One of these six locations would meet the pedestrian comfort criterion.

Project-Specific Locations

A total of 23 additional pedestrian-accessible locations within and adjacent to the ballpark were measured. The pedestrian wind criterion would be exceeded at 15 of these 23 additional locations. These fifteen locations would be within the ballpark itself: on the open Upper Concourse, on the Bleacher Concourse, on the Main Concourse, and at the upper-level location on the King Street frontage. These locations do not include any ballpark seating areas; seating areas were not tested for the EIR. These represent open public areas within the ballpark. Six locations would be on or near the pedestrian walkway fronting China Basin, and two would be on the sidewalk along the project's Third Street frontage. See Figure IV.D.12, p. IV.65.

Wind speeds on the Upper Concourse would range from 13 mph to 25 mph at five locations on the Third Street side, compared to 12 mph at one location on the Second Street side. Wind speeds at four locations on the Bleacher Concourse would range from 9 mph to 16 mph, while wind speeds on the Main Concourse at four locations between the Pavilion and the ballpark would range from 13 mph to 20 mph, and wind speed at the upper-level location on the King Street frontage would be 13 mph. Two of these 14 locations within the project would meet the pedestrian comfort criterion.

The wind speed at the Third Street side of the main entrance would be 14 mph, while the wind speed around the corner on the King Street side would be 14 mph also. Both would exceed the pedestrian comfort criterion.

Wind speeds at six locations along the Port Walk fronting China Basin would range from 8 mph to 15 mph; five of these six locations would meet the pedestrian comfort criterion.

Hazard Conditions

The project would eliminate the existing exceedances of the hazard criterion at two locations. At one of these locations, the wind speed is reported at 36 mph, but would not reach the 1 full hour needed to exceed the hazard criterion. With the project, the wind-hazard criterion would be exceeded at two other locations within the ballpark of the total 69 points. The total duration of all of the exceedances would be about 90 hours per year. The two new hazard exceedances within the ballpark, would occur at locations on the Upper Concourse 67 hours per year at Location No. 1, and 23 hours per year at Location No. 4, as shown in Figure IV.D.12, p. IV.65.

Because the two potential exceedances of the hazardous wind criterion would be within the ballpark itself, rather than on public sidewalks or open space, these effects would not be considered significant. These exeedances would occur outside of the ballpark seating area; seating areas were not tested for this EIR. On-site structures such as screens, arbors or trellises could be designed and constructed to eliminate hazardous wind conditions.

Project Plus Potential Cumulative Development

Future development of the presently undeveloped area upwind of the ballpark would be expected to affect the wind environment of the ballpark and would modify the wind effects of the ballpark itself. To evaluate these changes, a test scenario considered the effect of potential future development within the proposed North of Channel area of Mission Bay to the west and southwest of the project site on the wind environment of the project. Potential development for the area generally bounded by Third, Townsend and Seventh Streets and China Basin Channel was represented by approximate maximum building envelopes that reflect expected height districts and density of development in that area; no specific design information was available. Appendix B, Wind, p. A.61, outlines those building

assumptions. This analysis compares the wind environment with cumulative development to that of the project.

The wind environment of the project plus potential cumulative development would be similar to that of the project, but in general would reduce wind speeds. The wind increases and decreases described in this cumulative scenario are all as compared to the conditions with the project only. Compared with the project, wind speeds would decrease at 38 locations, increase at 13 locations, and remain the same at 18 locations. Wind speeds at some individual locations would increase by as much as 5 mph; at other locations wind speeds would decrease by as much as 9 mph. Overall, the project plus potential cumulative development scenario would add three pedestrian wind comfort criterion exceedances and would eliminate 18 project pedestrian wind comfort criterion exceedances, for a net total of 35 comfort criterion exceedances out of all 69 pedestrian test locations, a net reduction of 15 exceedances, relative to the project.

South of China Basin, wind speeds in the center of the parking area would decrease by 2 mph to 15 mph. On Third Street from the Lefty O'Doul Bridge north to the King Street intersection wind speeds would decrease at seven of eight locations by as much as 9 mph, to a range of 9 mph to 13 mph. Between King and Townsend Streets, wind speeds would increase 1 mph, to 13 mph, and decrease 6 mph, to 9 mph, on the east side and west side of Third Street respectively. Wind speeds at three of the four corners of the Third and Townsend Street intersection would increase and would range from 11 mph to 17 mph. Mid-block between Third and Fourth Streets, wind speed on King Street would decrease by 2 mph, to 14 mph, while wind speed on Berry Street would decrease by 4 mph, to 9 mph. Of these 18 locations, nine would meet the pedestrian comfort criterion.

Wind speed at the Third Street side of the proposed main entrance of the ballpark would decrease by 2 mph, to 11 mph; wind speed around the corner on King Street would decrease by 5 mph, to 9 mph. Both locations would meet the pedestrian comfort criterion.

At the Second Street and King Street intersection, wind speed changes would vary from an increase of 1 mph to a decrease of 2 mph, resulting in a range of 10 mph to 16 mph. More northerly along Second Street, wind speeds on the four corners of the intersection of Second Street and Townsend Street would remain unchanged or decrease by up to 2 mph and would range from 8 mph to 13 mph. Two of these eight locations would meet the pedestrian comfort criterion.

Wind speeds would decrease by up to 3 mph at six of eight locations on King Street adjacent to the project, and remain unchanged at two locations. Six of these eight locations would meet the pedestrian comfort criterion.

Wind speeds at four of five locations in the vicinity of South Beach Park would remain unchanged, while one would decrease 1 mph to a range of 13 mph to 15 mph. None of these five locations would meet the pedestrian comfort criterion.

East of The Embarcadero, wind speeds would remain unchanged at 16 mph near South Beach Harbor, and 12 mph near Pier 40. Neither of these two locations would meet the pedestrian comfort criterion.

Project-Specific Locations

The pedestrian wind criterion would be expected to be exceeded at about 10 of the 23 additional project-specific locations. Project wind comfort exceedances would be eliminated at 5 or 6 locations and one new exceedance would be created.

Wind speeds at locations on the west end of the Upper Concourse would change by about 1 mph and would range from about 12 mph to 25 mph; wind speed at one location on the east end would decrease by 3 mph to reach about 11 mph. Wind speeds on the Bleacher Concourse would change by 2 mph or less, to a range of 9 mph to 17 mph. Wind speeds at

four locations on the Main Concourse between the Pavilion Building and the ballpark would be expected to change by 3 mph or less, and would range from about 10 mph to 20 mph. With cumulative development, the number of locations within the project that would meet the pedestrian comfort criterion would not be expected to change.

Wind speeds at six locations along the proposed Port Walk fronting China Basin Channel would decrease on average by 3 mph, and wind speeds would range from 7 mph to 16 mph. Five of these six locations would meet the pedestrian comfort criterion.

Hazard Conditions

The cumulative development scenario would reduce the durations of both project hazard criterion exceedances and possibly eliminate one or both exceedances. The wind hazard criterion could thus be exceeded at one or two of the 69 locations. The total duration of the hazard criterion exceedances would be substantially reduced compared to the project conditions, which would have exceedances totaling 90 hours per year. The potential project hazard exceedances would occur within the ballpark at Location Nos. 1 and 4 on the Upper Concourse, as shown in Figure IV.D.12, p. IV.65. In addition to these hazard criterion exceedances, the wind speed at one other location near Pier 40 is reported at 36 mph, but would not reach the one full hour needed to exceed the criterion. These exceedances measured would occur outside of the ballpark seating area; seating areas were not tested in this EIR.

Improvement Measure

With development of the project, up to two locations within the ballpark on the Upper Concourse could experience winds that exceed the wind hazard criterion of 26 miles per hour for more than one hour per year. Because those exceedances would occur within the

ballpark and not on public sidewalks or open space, they were not identified as significant adverse impacts. The project could include structures, such as screens, arbors, or trellises, in the Upper Concourse area that would be expected to reduce those winds to below hazardous levels.

NOTES - Shadows and Wind

1. This section is based on a study entitled *Wind-Tunnel Test of the Pacific Bell Park Project*, March 6, 1997, jointly prepared by Charles B. Bennett, of Environmental Science Associates, and Bruce R. White, Ph.D. A summary of the study is included in Appendix B, Wind; a copy of the report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

2. Appendix B, Wind, Table X.B.1, pp. A.66 - A.68, presents all measured wind speeds that would be exceeded 10 percent of the time, when referring to the pedestrian comfort criterion, for the 69 test locations for each of the test scenarios. The percentage of time that the 11 mph comfort criterion is exceeded is shown for all locations where an exceedance was measured. Measured exceedances of the hazard criterion are presented in hours per year of exceedance.

E. TRANSPORTATION AND CIRCULATION

INTRODUCTION

This section presents the assumptions and methods used to analyze the impacts of the Giants ballpark at China Basin within an existing and cumulative travel demand context. Analysis of project impacts documented in this section focuses on the following elements of the transportation system:

- Traffic (freeway, freeway ramp, arterial street and street intersection)
- Transit (local MUNI bus and Metro rail; regional carriers including BART, CalTrain, Samtrans, AC Transit, Golden Gate Transit; and regional ferry services)
- Parking
- Pedestrian and Bicycle
- Freight Loading
- Project Construction

The impact analysis first considers the project added to the existing year 1996 transportation system. Existing traffic has been redistributed to account for the effects of transportation improvements that are currently under construction. The improvements are expected to be built prior to completion of the proposed project in year 2000. A separate discussion of year 2015 cumulative-plus-project impacts is also provided in this section. For both cases, impacts are evaluated for a sellout (42,000 seats) weekday afternoon, weekday night, and weekend game, assuming a crowd of 39,500 would be in attendance after accounting for "no-shows."[1] No transportation improvements beyond those currently in place, under construction or programmed for implementation have been assumed except four-car trains on the MUNI Metro Extension that is now under construction. The mitigation measures described in V.B. Transportation and Circulation, include ferry service to the ballpark, under consideration by the project sponsor and analyzed in Chapter VII. Variants to the Proposed

Project, as well as a variety of street, intersection and sidewalk measures that would improve traffic transit and pedestrian flows in the project area.

ANALYSIS ASSUMPTIONS

The number of person trips and vehicle trips estimated for this analysis represents the total number of trips generated by the proposed land uses, with no reduction or credit for trips that are currently made to and from the site. Existing uses of the site are maritime-related light-industrial businesses on the Port property and non-maritime light-industrial businesses elsewhere. The resulting analysis is conservative because it includes these existing trips which would be eliminated by the proposed project; therefore the analysis may overestimate slightly the total number of trips to and from the ballpark site. The number of trips generated by existing uses is small in comparison with the trips that would be generated by the ballpark before and after games. The existing parking facilities on the site were accounted for in the parking supply and demand analysis.

Another conservative aspect of the analysis is that traffic generated by the ballpark is added directly to the existing traffic counted on study area streets. No attempt was made to quantify the extent to which existing traffic would divert to other routes, travel modes or other time periods in order to avoid ballpark traffic on game days.

Analysis Time Periods

Peak traffic impact periods would occur in the hour immediately preceding a game and the hour following the end of a game. Based upon observations of ballgame attendance patterns,[2] approximately 70 to 75 percent of arrivals are concentrated in the hour immediately preceding a game and 80 to 85 percent of departures would occur in the hour

following the game. Also considered is the weekday commute peak hour (4:30 to 5:30 p.m.), when the transportation facilities and services are most heavily used.

The Giants currently play 81 regularly scheduled baseball games at home each season, which does not include special games such as home-exhibition games, All-Star games, playoffs or the World Series. As shown in Table IV.E.1, most games (approximately 42 games per season) would be played on weekday nights, beginning at 7:35 p.m. Weekend games (approximately 26 per season) would be anticipated to start at 1:05 p.m. The remaining approximately 13 games per season would be played during the afternoon on weekdays, customarily beginning at 12:35 p.m. This assumes approximately one weekday afternoon game for each "Home Stand."[3] Major League Baseball rules require that certain games be scheduled in the afternoon ("get-away" games) so that teams can travel afterward and have a reasonable amount of time before playing again the next day in another city.

In addition to ballgames, there could be other types of events including the following:

- up to five maximum-capacity events (approximately 50,000 persons or more);
- up to 20 other open-air events (15,000 to 42,000 persons);
- additional smaller open-air events (fewer than 15,000 persons); and
- from 30 to 40 music events in a temporary enclosed amphitheater inside the ballpark (5,000 to 15,000 persons)

The project sponsor has agreed that when these events occur on a weekday they would not be scheduled to end after 4:00 p.m. or begin before 7:30 p.m. These events could occur on weekdays or weekends. Except for the maximum-capacity events, the impacts of the other events would be similar to those of a ballgame. For more discussion of this issue see the section on Special Events in this section (IV.E).

Based on data provided by the Giants for the 1994 and 1995 seasons,[4] the average length of games including all extra-inning games played at 3Com Park was exactly three hours. Two-

thirds (67 percent) of Giant games lasted three hours or less and 88 percent of all home games lasted three and one-half hours or less. The Giants have indicated that most afternoon games would probably start at 12:35 p.m.[5] A 12:35 p.m. start for weekday games therefore would result in games ending before 4:00 p.m. on almost all occasions (statistically, fewer than two games per year would end after 4:00 p.m.), minimizing the overlap between ballpark traffic and the typical weekday peak commute hour of 4:30 to 5:30 p.m. This means that occasionally these games would extend beyond 4:00 p.m. The Giants have agreed that all other non-baseball events would be scheduled to end before 4:00 p.m.; however, occasionally an event could run longer than expected, which would create transportation impacts in the peak commute period. For weekday afternoon games, the ending time would be particularity critical for MUNI, as the availability of MUNI equipment to serve the ballpark diminishes as the peak commute period begins at approximately 3:30 p.m.

Based on an average length of game of three hours, the following study hours were chosen for the transportation analysis.

TABLE IV.E.1 ●
STUDY TIME PERIODS

Scenario	Approx. Number per Year	Scheduled Beginning Time	Assumed Game-end Time	Study Periods	Condition
Weekday Afternoon	13*	12:35 p.m.	3:30 p.m.	3:30-4:30 p.m.	Post-Game
Weekday Night	42*	7:35 p.m.	10:30 p.m.	6:30-7:30 p.m. 10:30-11:30 p.m.	Pre-Game Post-Game
Weekend Afternoon	26*	1:05 p.m.	4:00 p.m.	4:00-5:00 p.m.	Post-Game
Non-Game Days Restaurant, Office, Pavilion, Broadcast Studio are open	284	N/A	N/A	4:30-5:30 p.m.	No-Game

Note:
N/A = Not Applicable.
* = Baseball games only; a number of non-baseball events could also occur in these general time periods.
Source: *Transportation Background Report for the San Francisco Giants Ballpark at China Basin*, Wilbur Smith Associates, March 1997.

Current weekday traffic patterns in the study area result in a peaking condition between 4:30 and 5:30 p.m., when the volume of commute traffic leaving San Francisco is highest. The restaurants, office space, retail space, Pacific Bell Center, and broadcast studio would be open throughout the year. Because these uses would generate traffic on non-game days as well as game days, an analysis is presented which addresses conditions on non-game days during the peak commute hour of 4:30 to 5:30 p.m. The Giants indicate the following approximate operating hours: restaurant open for lunch (11:30 - 3:00 p.m.) and dinner (5:00 p.m. to 1:00 a.m.), Pacific Bell Center, retail space and Giants offices open from 9:00 a.m. to 5:00 p.m., retail space open from 10:00 a.m. to 5:00 p.m. everyday (except that the hours would be extended for night ballgames), and the broadcast studio open all the time.

Transportation Systems Assumptions

Travel demand forecasts are based on assumptions about planned transportation facilities and services. Two horizon years are analyzed: 2000 and 2015. Opening Day at the Giants ballpark is planned for April 2000. The long-term horizon year of 2015 was selected to consider the cumulative development context, including Mission Bay, the Rincon Entertainment Center, the Waterfront Land Use Plan and the Transbay Transit Terminal Redevelopment Survey Area and other long-term growth in San Francisco and the Bay Region. The year 2015 horizon was selected in consultation with the San Francisco Planning Department and the Metropolitan Transportation Commission (MTC) staff. Transportation facility assumptions included in the *1996 Regional Transportation Plan* for the year 2015, and *1995 San Francisco Congestion Management Program Capital Improvement Program* for year 2000 can reasonably be expected to be constructed by these horizon years, and are assumed in this study, as described below.

Year 2000 Transportation Improvements

Construction projects currently underway in the vicinity of the project site are assumed to be completed by the year 2000. As shown in Figure IV.E.1, these include the following.

Year 2000 Roadway Improvements

The following improvements are approved and scheduled to be open to traffic by the year 2000. With the exception of the last two items, all are now under construction.

- King Street from The Embarcadero to Fifth Street - Six travel lanes on weekdays from 3:30 to 7:00 p.m. During other times, there will be four lanes plus parking on both sides of the street.

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

● **Figure IV.E.1 Planned Transportation Improvements**

- I-280 northbound two-lane "touchdown" ramp relocated from Fourth/Berry to Fifth/King Streets. The Berry Street off-ramp will be removed.
- New I-280 southbound two-lane on-ramp added at Fifth/King Streets.
- Extension of Fifth Street from King Street to Berry Street.
- Reconstruction of two-way three-lane Berry Street from Third to Seventh Streets. Catellus Development Corporation has proposed closing Berry Street between Fourth and Sixth Streets as part of the revised *Mission Bay Plan* north of the Channel. At this time this proposal has not been approved by the City, and for the ballpark analysis the street is assumed to be open.
- Relocation and widening (at Fremont Street) to four lanes, Fremont Street off-ramp to Folsom/Fremont Streets. The existing two-lane off-ramp to Fremont/Howard Streets will be rebuilt in 1997 with two lanes heading to northbound Fremont Street and two lanes connecting to eastbound Folsom Street.
- Reconstruction of The Mid-Embarcadero roadway - Six travel lanes on weekdays from 3:30 to 7:00 p.m. During other times, there will be four lanes plus parking on both sides of the street.

Year 2000 Parking Improvements

Assumptions are based on information provided by the Giants:

- For-fee dedicated parking provided by the Giants for 5,000 project-generated vehicles south of China Basin Channel.
- No designated ballpark parking is assumed to be available north of China Basin Channel. Parking north of China Basin Channel would be distributed among off-street facilities and some on-street parking throughout the study area depending on availability. Demand is anticipated to be constrained by competition for parking spaces, the price of parking, and walk-times to the ballpark.

Year 2000 Transit Improvements

Base case assumptions for transit service to the Giants ballpark rely primarily on existing services with some modifications to better serve the ballpark as discussed below. Planned

service improvements were also assumed. The major planned service improvement in the area is the MUNI Metro Extension (MMX) light rail service. By spring 1998, MUNI plans to complete the extension of its Metro light rail service from The Embarcadero BART/MUNI Metro Station at Market Street to the CalTrain station at Fourth and Townsend Streets in San Francisco. Initially, service will run only between Fourth and King and The Embarcadero BART/MUNI station. The route of the 32-Embarcadero bus line will be revised to operate between Hyde/Beach and Mission/Embarcadero. Later in 1998, MUNI plans to discontinue the shuttle and extend MUNI's J-Church rail line directly to Fourth and King Streets. MUNI is also proposing to implement changes to CalTrain express lines 80X / 81X / 82X in 1998 that would consolidate the three lines into two. Finally, in summer of 1998, MUNI is proposing to reroute the 42-Downtown Loop to serve Second Street between Howard and Brannan Streets.

San Francisco has had a "transit first" policy for over 20 years, implemented through provision of bus and light rail service throughout the City and County, support of regional transit systems, and policies to discourage long-term commuter parking. The result of the policy and its implementation is a high degree of transit ridership by residents and commuters. About 46 percent of people who work in San Francisco use transit to get to work; in the greater Downtown area (north of Townsend Street) about 60 percent use transit.[6] The project area is already well served by transit, with service to the CalTrain depot provided by several MUNI bus lines and expanded service planned on the MUNI light rail system now under construction. Therefore, a high level of transit service has been assumed in the base case transportation area scenario. Except for minor improvements, the base case would not require new capital expenditures for facilities and equipment. However, in some cases, the base case, consistent with the City's transit first policy, stipulates more service than would be provided without the ballpark. As a result, MUNI and other transit operators would experience increases in operating expenses that they would not have experienced without the ballpark. In addition, the need to move high volumes of passengers quickly would create difficulties in the actual collection of fares, which if not properly addressed could result in reduced revenue from special ballpark bus services.

New transit services which exceed current existing or planned levels are as follows:

- CalTrain would add a late night train on game days only, to coincide with the end of weekday night ballgames. CalTrain plans to operate a post-game train with reasonable capacity after each game where there is no regularly scheduled train. It will be necessary for any such service pattern to cover at least incremental operating costs.

- MUNI MMX light rail service from Market Street to Sixth/King Streets would include four cars per train and existing J-Line frequencies. Current plans call for single-car trains only, but equipment is available to operate four-car trains before and after ballgames. MUNI would experience increased operating expenses due to the personnel and transportation related expenses of operating the longer trains. Absent additional funds, service in other areas of the City might need to be temporarily reduced somewhat in order to provide four-car MMX service to/from the ballpark. (See also V.B. Transportation and Circulation, p. V.40.)

- MUNI would provide non-stop bus service from Market Street along Second and Third Streets (called a "bus bridge") using re-deployed 3Com Park "ballpark special" buses.[7]

- Tripper (extra, single-trip) buses would be added, as needed, on the MUNI Lines 15, 30, 42 and 45 to provide necessary capacity increases. Tripper buses are extra bus trips added to basic routes in order to provide added capacity. It is assumed that these "tripper" buses would be available when MUNI re-deploys the existing 19 coaches serving "ballpark express" runs (on the 9X, 28X and 47X lines) to and from Giants games at 3Com Park.

- A ballpark 38 Geary Limited is envisioned as the only non-tripper ballpark service. It is assumed that on game days the 38L would begin and end at the ballpark, rather than the Transbay Terminal where the existing 38 Limited service now terminates.

- MUNI F-Line streetcar service would be provided from Market Street to Fisherman's Wharf, with transfer to the MMX on Market Street (under construction). The option for direct non-transfer service from the ballpark to Fisherman's Wharf may eventually be implemented but is not assumed in this report.

- Golden Gate Transit, SamTrans and AC Transit service would be available at the Transbay Terminal. Ferry service for the project scenario is assumed to be based at the Ferry Terminal Building located at the foot of Market Street. Consistent with current schedules on weekday nights, no ferry service from the Ferry Building is assumed for departing fans.[8] By the year 2000, Golden Gate Transit will have added a new ferry to the Larkspur/San Francisco run. Although this ferry could depart San Francisco as late as 10:00 p.m., it does not appear it would remain late enough to serve week night ballgames.

Year 2015 Transportation Improvements

The roadway, parking and transit facilities and services described above for the year 2000 ("existing-plus-project") scenario are assumed to remain by the year 2015. Additional improvements assumed to be completed between 2000 and 2015 are described below.

Long-term improvements have been based on the Mid-Embarcadero Roadway Replacement "DPT Variant," adopted by the Board of Supervisors in November 1996. Removal of peak period high-occupancy vehicle (HOV) restriction at the Sterling Street on-ramp to eastbound I-80 and replaced at the Essex Street on-ramp to eastbound I-80 was proposed as part of other alternatives in the Roadway Replacement analysis. The DPT Variant assumed the switch in HOV access only if warranted by traffic conditions. It was assumed that the HOV restrictions would not change for the ballpark analysis. Because many ballpark-related vehicles would have an auto occupancy of three or more, many ballpark patrons could use the Sterling Street on-ramp after weekday afternoon games. As a result, whether or not the HOV restrictions remain is not a major issue for ballpark traffic.

Year 2015 Parking Improvements

Development of Mission Bay housing and commercial uses north and south of China Basin Channel are assumed in this transportation study by the year 2015. It is reasonable to also assume the provision of new off-street parking facilities to serve Mission Bay. For the year 2015 project scenario it is assumed that:

- The approximately 5,000 dedicated surface lot parking spaces to be provided south of China Basin Channel would either be available through the year 2015 or would be replaced by a parking garage(s). Due to increased demand generated by Mission Bay development, it is assumed that no Mission Bay parking other than the 5,000 dedicated parking spaces to be provided by the Giants would be available for ballgame fans.

Chapter VII, Variants to the Proposed Project, discusses the impacts of providing no dedicated ballpark parking south of the Channel.

Transit Improvements Completed 2000 - 2015

The following are all adopted by MTC in the *1996 Regional Transportation Plan* (RTP). While inclusion in the RTP does not assure that these improvements will be constructed, it does represent a regional priority by MTC, the policy body with authority to set such priorities.

- MUNI light rail is scheduled to be constructed in the year 2003 along Third Street as far south as the CalTrain Bayshore Station. At this time, the following alignment alternatives in the vicinity of the ballpark are being examined:
  - Southbound on the Peter Maloney (Fourth Street) Bridge and northbound on the Lefty O'Doul (Third Street) Bridge;
  - Extension from Sixth and King over China Basin Channel on a new bridge and along Sixteenth Street to Third Street; or
  - A two-way line over the Peter Maloney Bridge.

  This Light Rail extension could improve transit access to the ballpark from the south. The base year 2015 analysis for the ballpark assumes that the Third Street light rail will operate southbound across the Peter Maloney Bridge and northbound across the Lefty O'Doul Bridge. This alignment would reduce traffic capacity on these streets by one lane in this area, as it is assumed that there would be exclusive transit lanes. On the Peter Maloney Bridge, which has three lanes, a signaling system is proposed to be used to allow traffic to share the lane with the light rail tracks except when light rail vehicles are actually crossing the bridge. South of the Third Street/Fourth Street intersection, the light rail would use one traffic lane in each direction on Third Street. The Third Street light rail line is assumed to connect with the MMX line at King and use those tracks to reach The Embarcadero and Market Street. The option of a Third Street north line directly to Downtown is also under study as part of the Third Street light rail project but is <u>not</u> included as part of the 2015 base analysis for the Giants ballpark. If the Third Street light rail were to extend directly to Downtown, it might improve access to the ballpark from the north.

- BART is assumed to be extended to San Francisco International Airport and Millbrae, with a CalTrain and BART intermodal station constructed in Millbrae.

Effect of Proposed CalTrain Downtown Extension

An EIS/EIR for the CalTrain San Francisco Downtown Station Relocation Project is currently being prepared by the Peninsula Corridor Joint Powers Board. This study is evaluating several alignment alternatives in connection with the proposed extension of CalTrain rail service from the existing terminus at Fourth and Townsend Streets to a new Downtown rail station in the vicinity of the present Transbay Terminal at First and Mission Streets.

The alternatives presently under active consideration show the rail tracks entering a tunnel just west of the Fourth and Townsend Streets intersection, then continuing underground to the proposed new station. (A longer tunnel originating south of China Basin Channel is not currently under active consideration due to high cost; however, a tunnel starting near Seventh and Townsend Streets is one of the options still being considered.) Between Seventh Street and the tunnel mouth, the tracks would either be located in the median of a widened Townsend Street or, alternatively, in a right-of-way along the south edge of Townsend Street. Both these alternatives provide for a surface station between Fifth and Sixth Streets which would replace the existing Fourth and Townsend Streets station.

The station would consist of two sheltered boarding platforms 680 feet (ft.) long, positioned outside the inbound and outbound tracks. This plan would impact CalTrain service to the ballpark in two ways. First, while preserving a station near the project site, it would relocate and reconfigure the facility, moving it one block further west from the ballpark. Second, it would permit introduction of train service between the Transbay Terminal area and the project site vicinity.

Relocation and reconfiguration of the station facilities near the project site would have the following effects:

- The location of the proposed new station would shift approximately one block further west from the project site and one-half block north from the existing station. The average distance between the train and the project site would be approximately four city blocks rather than two and one-half to the existing station.

- The new station would be configured as a "through" facility rather than a stub-end station. In addition, it would be an intermediate station rather than a terminal, containing three tracks rather than 12. These factors would make it more difficult for the new facility to handle large outbound crowds efficiently. The existing station can hold several trains awaiting the end of a game without interference to other scheduled service. As passengers arrive at the station after the game, they can disperse to different platforms to board the appropriate train. At the proposed new station, up to two trains could be staged at once, if the third track is used as a staging track. If departing crowds are large, they may exceed the capacity of the platform (as sometimes happens at the BART Coliseum station in Oakland after games) and some passengers may be forced to wait on the sidewalk or elsewhere away from the platforms until their train arrives.

The ability to carry passengers between the Transbay Terminal and the Giants ballpark area would exist after construction of the Downtown extension, though this is likely to have minimal utility as a ballpark transportation service for the following reasons:

- With the proposed location of the station between Fifth and Sixth Streets on Townsend Street, the MUNI Metro and bus shuttles on Second and Third Streets will likely be perceived as faster and more convenient, particularly since they will serve the ballpark directly. They would also serve Market Street directly, rather than originating or terminating at Mission Street.

- The MUNI Metro and bus services would have more frequent service than any CalTrain service, unless CalTrain elects to run special shuttle train service between the Transbay Terminal and the ballpark area station. For several practical reasons, including high costs, limited revenue potential and limited equipment availability, it is unlikely that CalTrain would elect to operate a shuttle service covering only eight city blocks. Instead, it is more likely to concentrate on the longer-haul services for which commuter rail is more ideally suited: namely between Peninsula points, Mission Bay and downtown San Francisco.

PROJECT TRAVEL DEMAND

Redistribution of Existing Travel Demand on New Facilities

Localized travel patterns will adjust to the opening of new facilities and transit services as described below. Assumptions were made regarding how existing travel will redistribute on the improved transportation network shown in Figure IV.E.1, p. IV.80. These are based on observations of current travel patterns and a review of intersection turning movement counts conducted in 1996.[9]

- King Street will distribute traffic between City streets and the I-280 ramps now under construction. King Street will also shift some through traffic from Townsend Street between Fourth Street and The Embarcadero.
- I-280 Touchdown Ramps to King Street will replace the northbound I-280 off-ramp to Fourth/Berry Streets. The new on-ramp to southbound I-280 will shift freeway-destined traffic from the area east of Fourth Street while freeway-destined traffic west of Fourth Street will continue to use the Sixth Street on-ramp to I-280.
- Fifth Street Extension will serve the planned Mission Bay development north of China Basin Channel.
- It is assumed that Berry Street will continue to serve local two-way traffic between Seventh and Third Streets, with on-street parking remaining on the south side in front of the China Basin Building.
- Relocation of the westbound I-80 Fremont Street off-ramp to Folsom/Fremont Streets will redistribute 20 percent of off-ramp traffic to eastbound Folsom Street with the remainder using Fremont Street. These are based on July 1996 off-ramp observations made by Wilbur Smith Associates (WSA) during all study time periods.[10]
- Extension of the MUNI MMX light rail service to Sixth/King Streets initially, and Bayshore/Visitacion Valley ultimately, will likely create a shift in travel mode for some existing travel in the South Beach, China Basin, Mission Bay, Bayshore, Hunters Point, and Visitacion Valley areas of San Francisco. Base level ridership estimates made by WSA[11] suggest that 5,000 riders per weekday would use the MMX service between the CalTrain Depot and Market Street, with the predominant flows being toward the CalTrain Depot during the weekday afternoon and early evening study periods. Due to the unavailability of station-specific forecasts, it is assumed that MUNI MMX will not change traffic or pedestrian volumes from existing street, sidewalk, and crosswalk counts.

Baseball Game Attendance

Compared with 3Com Park, the ballpark would be expected to generate higher average attendance and to alter present origin-destination patterns and mode of access profiles. Attendance is expected to increase, relative to 3Com Park, due to the proximity of the ballpark to downtown San Francisco activities, a multi-modal transportation network, and the interest generated by a new ballpark. Origin-destination patterns to and from the ballpark would shift due to influences of the transportation network serving Downtown and the location synergies with Downtown employment, tourism and shopping/recreational centers.

The number of person-trips made by fans to the ballpark is estimated based on the number of seats, assuming a sellout crowd. The total number of ballgame trips includes all people coming to or leaving a game, as listed in Table IV.E.2, including fans, employees and concessionaires.

Average 3Com Park attendance for all 81 Giants home games in 1996 was about 16,000. The largest crowd attracted in 1996 was 48,800 fans. The capacity for Giants games at 3Com Park in 1996 is 63,000. Statistics provided by the Giants indicate that average attendance during the 1991 through 1995 seasons was approximately 24,000 fans while average annual attendance during these years was 1.94 million.[12]

This analysis considers the impacts of sellout games at the ballpark, when all 42,000 seats are sold. In 1993, which was a record attendance year for the Giants (2.6 million paid attendance), 21 of the 81 home games had a paid attendance of 42,000 or more. This represents sellout conditions occurring at the new ballpark 26 percent of the time. Forecasts of attendance prepared for the Giants estimate a paid attendance of 3.1 million in the year 2000.[13] This suggests that approximately 30 sellout games would occur, representing 37 percent of the games. For the remainder of the games the impacts would be less than these sellout conditions. After the first year the attendance is expected to stabilize at 2.7 million, or close to the level experienced in 1993, for several years. This analysis is quite

TABLE IV.E.2
ATTENDANCE ASSUMPTIONS

Game Day Attendance	Number of People	Typical Arrival Time			Typical Departure Time		
		Weekday Afternoon	Weekday Night	Weekend	Weekday Afternoon	Weekday Night	Weekend
Giants Executive Office Staff[1]	110 - 120[2]	8:30 a.m.	8:30 a.m.	10:00 a.m.	5:30 p.m.	11:00 p.m.	4:30 p.m.
Giants Game Employees[3]	395 - 465	11:00 a.m.	5:00 p.m.	11:00 a.m.	4:00 p.m.	11:00 p.m.	4:30 p.m.
Concessionaire Employees (including retail/novelty staff)	605 - 715	10:00 a.m.	4:00 p.m.	10:00 a.m.	4:00 p.m.	11:00 p.m.	4:30 p.m.
Players, Coaches and Trainers - both teams	75 - 80	9:00 a.m.	3:00 p.m.	9:00 a.m.	4:00 p.m.	11:00 p.m.	4:30 p.m.
Media Personnel, including broadcast studio staff	135	10:00 a.m.	5:00 p.m.	10:00 a.m.	5:00 p.m.	11:30 p.m.	5:30 p.m.
PacBell Pavilion and Retail Staff	25 - 30	9:00 a.m.	5:00 p.m.	9:30 a.m.	6:30 p.m.	11:30 p.m.	6:30 p.m.
Centerfield Restaurant/Retail Staff	82 - 103	10:00 a.m.	4:00 p.m.	10:00 a.m.	5:30 p.m.	12:00 p.m.	6:00 p.m.
Fans	39,500	See Table IV.E.3			See Table IV.E.3		
Total	**40,900 - 41,050**						

Notes:
Game times assumed to be 12:35 to 3:30 p.m. for weekdays, 7:35 to 10:30 p.m. for weeknights and 1:05 to 4:00 p.m. for weekend games.

1. All but 30 of these employees work during typical office hours (8:30 a.m. - 5:30 p.m.) regardless of game schedules.
2. For night and weekend games, 30 employees remain at work through the duration of the game.
3. Includes groundskeepers, engineers, plumbers, medical support, switchboard operators, ticket sellers and takers, ushers, parking cashiers and attendants, security, maintenance, and law enforcement personnel, guest services, mezzanine hosts.

Sources: Wilbur Smith Associates; letter from Jack Bair, Vice President and General Counsel, San Francisco Giants, to EIP Associates, October 16, 1996. A copy of this letter is on file at the Office of Environmental Review, Planning Department, at 1660 Mission Street.

conservative; it is likely that sellouts ultimately would represent fewer than half the games each year and that the impacts of most games would be less than those addressed in this analysis.

A six percent (6%) "no-show" factor is also assumed, resulting in an actual attendance of 39,500 for a sellout game. This is a conservative assumption based on Giants records for the last three years.[14] Turnstile vs. ticket data for 1993, when the Giants posted the team's best San Francisco record, indicate that most games had at least a 6 percent "no-show" proportion with an overall average of 11 percent. Two games had 4 percent and 5 percent "no shows," respectively. The Giants also provided information for other new ballparks which confirmed that the "no show" assumption of 6 percent is conservative.[15]

As has been noted there would also be a number of other non-baseball events at the ballpark. All of these events would be similar to or smaller than a sellout game, with the exception of up to five maximum-capacity events which could have approximately 50,000 attendees.

Arrival/Departure Patterns

Using the assumed start and end-of-game times presented earlier in this section on pp. IV.76 - IV.78, the percentage of fans arriving during the study time periods is presented in Table IV.E.3. The assumptions used in this study are based on observations at 3Com Park, data obtained from other cities with Major League Baseball teams, and a research report published by the Institute of Transportation Engineers (ITE) entitled *Traffic Operations Planning for Stadia and Arenas, 1994.* The arrival and departure patterns are stratified by mode of access and whether it is a weekday afternoon, weeknight or weekend game. There are many factors which influence arrival and departure times, including the game score, weather, traffic conditions, and the nature of pre- and post-game activities. These factors were used to produce the assumptions shown in Table IV.E.3.

It is assumed that 23 percent of fans in autos would arrive early (more than one hour prior to game time) to find parking and/or go to restaurants or shops before the game and 25 percent

TABLE IV.E.3
TRIP ARRIVAL AND DEPARTURE ASSUMPTIONS

	Percent of Fans Arriving/Departing to/from the Ballpark			
	Weekday/Weeknight		Weekend	
Time Period	Auto	Transit/Walk	Auto	Transit/Walk
Arrive More Than 2 Hours Before Game	4	0	17	0
Arrive Between 1 and 2 Hours Before Game	19	10	23	10
Arrive Less than 1 Hour Prior	68	90	50	90
Arrive After the Game Begins	9	0	10	0
Depart Before Game Ends	25	15	15	0
Depart Less than 1 Hour After Game Ends	72	85	82	90
Depart Between 1 and 2 Hours After Game	3	0	3	0

Sources: ITE Technical Council Committee 6A-50 Informational Report, *Traffic Operations Planning for Stadia and Arenas*, 1994 and *Traffic Considerations for Special Events*, 1975; WSA data for Jack Murphy Stadium in San Diego, 1989; *A Traffic Study for Coors Field* in Denver, 1994; WSA data collected after a Giants game at 3Com Park on Friday April 12, 1996 (opening day). Wilbur Smith Associates.

of fans in autos would leave the game early to "beat the traffic" on weekday afternoon and night games. It is assumed that 90 percent of fans on transit would arrive and 85 percent would depart in the hour immediately preceding and following a weekday or weekday night game. On weekends, it is assumed that more fans would arrive early and fewer would leave early.

These assumptions are consistent with the observation on April 12, 1996, when WSA conducted surveys at 3Com Park after the Giants home opener against the Cubs. A "turnstile" crowd of 41,800 attended, and the score was close at the end of the game. Despite the closeness of the game score, WSA vehicle counts at the intersection of Gilman/Fitch/Candlestick and at Jamestown/Third Street show that 35 percent of departing vehicles were observed leaving the site before the game ended. Because this was a Friday afternoon game that ended at 4:00 p.m., it is likely that many people left early in an effort to "beat the traffic." It must also be noted that opening day includes a disproportionate number

of people who are not frequent ballpark patrons, but are just attending the "event." Behavior on opening day, then, might be considered atypical of mid-season.

Counts conducted by WSA in San Diego in 1989, assumptions made in a traffic study for Coors Field in Denver, and counts conducted by WSA on April 12, 1996, at 3Com Park establish the arrival and departure patterns in Table IV.E.4.

Arrival and departure patterns at other ballparks are presented in a *Compendium of Major League Baseball Ballpark Transportation Data* (a copy is on file at the Office of Environmental Review, Planning Department, at 1660 Mission Street) to compare with assumptions for this study. These data indicate that the peak hour for fan departures began 15 minutes before the end of the game. This was confirmed by data collected after Giants games at 3Com Park where each game was "close" until the ninth inning, thus giving fans incentive to stay.

Travel Distribution

Geographic Distribution of Fans

The origin and destination of trips to the ballpark are important in assigning a transportation mode and specific route or service. The method used in this analysis was to first determine the current distribution of trips to 3Com Park and then assess how this would change based on a new location and addition of new patrons.

Existing origin-destination patterns of fans traveling to 3Com Park are based on three surveys, conducted for the Giants in 1993, 1988, and 1981. The most current data were collected in 1993 for the Giants by Parallax Market Research as part of a comprehensive market research effort. The market research indicates that approximately 33 percent of fans reside on the Peninsula and in the South Bay, 17 percent reside in the East Bay, 4 percent

TABLE IV.E.4
ARRIVAL/DEPARTURE PATTERNS

	Denver	San Diego	3Com Park
Fan Arrival Patterns			
1 to 2 Hours Before Game Starts	35%	32%	---
Less than 1 Hour Before Game Starts	55%	56%	---
After Game Starts	10%	18%	35%
Fan Departure Patterns			
Before Game Ends	10%	18%	35%
End of Game	90%	82%	65%

Source: *Compendium of Major League Baseball Ballpark Transportation Data*, Wilbur Smith Associates, 1996.

live in the North Bay, and 15 percent live in San Francisco. The remainder came from locations beyond the Bay Area such as the Central Valley and the Monterey Peninsula.[16] The 1988 survey found a higher percentage of San Francisco residents and a lower proportion of Central Valley residents. The difference in the case of the Central Valley was probably due to differences in the definition of the geographic area used in each survey.

Assumptions about trips made by people traveling to the ballpark from work, hotels or other non-home-origins are made based on survey data conducted for the Giants, as well as information about experiences in other cities with downtown baseball parks including Denver, Seattle, Baltimore and Boston. Trips to and from a ballgame are stratified as coming from a residence or some other location—referred to hereafter as "non-home based" origin. Trips are further stratified by weekday afternoon, weekday night or weekend game since travel patterns have been shown to be different for these distinct game times.

The following process was used to define the changes in geographic trip origins. Existing trip origins are assumed to continue for the existing average attendance of 24,000 fans. The

"growth" in attendance to sellout levels at the ballpark represent "new" fans; their trip origins are estimated based on the following three-step approach:

1) Estimation of proportion of visitors (non-Bay Area residents);
2) Estimation of proportion of non-home-based trips to/from the ballpark; and
3) Estimation of the location of (Bay Area) fan residences.

Trip origin changes are based on available market research data[17] and changes in access characteristics for the ballpark, relative to 3Com Park.

Proportion of Visitors

Visitors are defined for this analysis as fans not residing in the Bay Area. These include persons on convention and business trips, and vacations. The 1993 market research survey suggests that about 5 percent of Giants fans are visitors. Experience at downtown Baltimore's Camden Yards indicates that, shortly after it opened, the proportion of fans attending from outside the Baltimore-Washington metropolitan area (a standard metropolitan statistical area) increased from 15 percent (at Memorial Stadium) to 24 percent (at Camden Yards).

It is assumed that the new ballpark would achieve and sustain higher levels of visitor patronage than 3Com Park. San Francisco is a very attractive tourist/visitor destination. A ballpark conveniently located to Downtown and waterfront areas should attract a large number of tourists. While no market research surveys have been conducted to test tourist preferences for ballgames in San Francisco, it is assumed that weekday afternoon games would attract the highest proportion of visitors because tourists are free to attend games during the weekday and tickets are more likely to be available. Weekend games would attract more Bay Area fans, and weeknight games seem most attractive to workers and local residents and would probably draw fewer visitors. For this study, the percentage of visitors is forecasted to increase to 7, 8 and 10 percent, respectively, for weeknight, weekend and

weekday afternoon games. These assumptions, which are conservative, reflect an increase that is proportionally comparable to the changes realized in Baltimore.

Proportion of Non-Home-Based Trips

Home-based trips have either an origin or destination at a residence. Not all fans travel directly to the ballpark from their residence nor do they always go directly home after the game. Some fans arrive at the ballpark from their work site or from restaurants, shops, and recreation sites. The proximity of the ballpark to downtown and waterfront activity centers would result in an increase in the proportion of fans coming from these areas and a corresponding decrease in the proportion of fans coming from home. Similarly, after games, some fans will elect to return to work, go to a restaurant, or other activity, instead of returning directly home. After night games, however, the traffic study makes the conservative assumption that 100 percent of the fans would leave for home within an hour after the game.

Approximately 30 to 45 percent of fans reported[18] coming to 3Com Park games directly from work on weekday afternoons and weeknights, whereas few reported coming to games from work on weekends. A market research report[19] prepared for the Baltimore Orioles' new Camden Yards ballpark found that 35 percent of fans had visited restaurants, bars and other attractions downtown before or after a weeknight game. The experience at both 3Com Park and Camden Yards suggests that at least 40 percent of all fans going to a weeknight game would either already be Downtown or would arrive in the Downtown area early rather than arriving directly to the ballpark from home.

Based on the information described above, the proportion of non-home based trips was developed for each game time studied, as shown in Table IV.E.5.[20]

TABLE IV.E.5
PROPORTION OF NON-HOME BASED TRIPS

	To Game	From Game
Weekday Afternoon	27%	18%
Weekday Night	40%	0%
Weekend Day	11%	25%

Note:
Excludes visitors who reside outside the Bay Area.

Source: *Compendium of Major League Baseball Ballpark Transportation Data*, WSA 1996, Wilbur Smith Associates.

Location of Fan Residences

The same basic geographic areas which were used for the previous market research studies were retained for this transportation analysis, except that the I-80 corridor between the Bay Area and Sacramento is added to account for the fan base between Fairfield and Sacramento.

A portion of this corridor includes current commuters to San Francisco. In general, the market areas include four similar groupings:

- Origins where access would improve relative to 3Com Park: Alameda, Contra Costa, and Marin Counties;
- Origins where transit access would improve but auto access would be more difficult, relative to 3Com Park: San Mateo and Santa Clara Counties;
- Remote day-trip origins: Santa Cruz/Monterey, Sonoma/Mendocino, Central Valley, and I-80 corridor; and
- City and County of San Francisco.

Access improvements are used as the basis for estimating the origin and destination of increases in attendance. For example, the ballpark would be more convenient for San Francisco fans since the City's street and public transit systems provide better access to the

study area than to 3Com Park. Similarly, East Bay fans would find the proximity to transit more convenient than for games at 3Com Park.

Weekday night games are anticipated to attract a substantial number of commuters due to the convenient location near Downtown employment centers. More City residents are also anticipated for night games recognizing that close-in fans would still be able to get home at a reasonable hour after a game. Weekday afternoon game attendance is expected to increase uniformly in all market areas and to have the highest proportional increase in tourist patronage. While South Bay fans would have farther to drive, their access would improve due to the proximity of CalTrain service. Weekend games are anticipated to attract higher proportional increases in non-Bay Area fans (i.e., Central Valley, Santa Cruz/Monterey and the I-80 Sacramento corridor) compared to weekday games. Detailed information regarding ballpark trip origins and destinations is provided in Appendix C, and in the *Transportation Background Report for the San Francisco Giants Ballpark at China Basin*.

Mode of Access and Departure

Most fans arrive and depart 3Com Park via automobiles with a small proportion using public transit and charter buses. MUNI reports that it typically serves about 3.5 percent of the attendance at baseball games, regardless of crowd size or the time of the game.[21] SamTrans reports that its ballpark service is used by 50 or fewer patrons per game.[22] Limited weekday observations indicate about 10 charter buses parked at 3Com Park. Estimating an average load of 35 fans per charter bus yields 350 fans per game, or less than 2 percent of the total attendance, arriving by charter bus. Public transit and charter buses combined serve about 5.5 percent of the total attendance at 3Com Park. Walking is estimated to account for about 0.5 percent of the attendance, and autos serve the remaining 94 percent.

Mode Split Assumptions

Transit mode share is estimated to increase substantially at the ballpark, which would be much better served by transit than 3Com Park. A mode share of 30 percent (weekday afternoon games) is estimated for the new ballpark compared to 3.5 percent for 3Com Park. Table IV.E.6 shows the mode share assumptions by mode for each study time period for ballpark patrons. The Bay Area and San Francisco in particular achieve relatively high levels of transit ridership. Parking rates near the project site would be at least as high as the present rates at 3Com Park which should encourage use of the convenient transit services that are expected to be provided.

The assumed mode split for ballpark trips is provided in Table IV.E.7, p. IV.101, by person trips for a weekday afternoon, weekday night and weekend. Detailed mode split data based on the *Citywide Travel Behavior Survey* (CTBS), 1993, is provided in Chapter 3 of the Background Transportation Report.

The person trip demand for transit was assigned to the appropriate local (MUNI) and regional transit operators. Table IV.E.8, p. IV.102, provides a summary of these demands for each transit operator. It also includes the transit demand generated by ballpark employees. Note that these demand numbers represent the number of transit riders that would use each transit mode in the one-hour period before or after the game. Thus they differ somewhat from the numbers in Table IV.E.7, which represent all fans using transit in the two hours before and after games as well as during the game itself. Travel after a weekday night game on MUNI is shown as less than travel to the ballpark before a nightgame based on assumptions that some fans travel by bus to the game from work or home, meet friends who drove to the game and travel home in that car. This assumption is also reflected in changes in automobile occupancy, discussed below (p. IV.100).

TABLE IV.E.6 ●
BALLPARK PATRON TRAVEL DEMAND BY MODE

	Weekday Afternoon	Weeknight		Weekend
Travel Mode	**Post-Game**	**Pre-Game**	**Post-Game**	**Post-Game**
MUNI Metro	8.7%	9.8%	3.1%	8.0%
CalTrain	6.5%	1.9%	3.3%	2.5%
BART	5.5%	2.7%	4.7%	1.1%
Bus	9.5%	9.1%	6.9%	7.2%
Charter Bus	1.9%	1.9%	1.9%	2.4%
Walk	11.8%	13.6%	2.1%	11.6%
Bicycle	0.9%	0.3%	0.3%	1.2%
Taxi	0.9%	1.1%	0.4%	0.8%
Auto	54.3%	59.6%	77.3%	65.2%
Total	100.0%	100.0%	100.0%	100.0%

Source: Wilbur Smith Associates.

Auto Occupancy Rates

The average number of fans in each vehicle is referred to as the auto occupancy rate. A rate of 2.7 is assumed for weekday afternoon and weeknight games with an increase to 2.8 for departures after a weeknight game, reflecting the "meet you at the ballgame" and "catch a ride home" activity for some patrons. The weekend vehicle occupancy is assumed to be 2.9 reflecting typically higher ridesharing. These assumptions are higher than existing auto occupancy rates at 3Com Park, which range from 2.5 to 2.6 persons per vehicle, but are comparable to rates for downtown ballparks in other cities such as Denver and Boston. It is assumed that the auto occupancy rate would be higher at the ballpark compared with 3Com Park due to a constrained parking supply. That is, competition for off-site parking in the China Basin area is expected to result in market-rate pricing of parking, which would provide an incentive to share rides to the game. The occupancy of non-home based autos was

TABLE IV.E.7 ●
BALLPARK PATRON TRAVEL DEMAND BY MODE
(PERSON TRIPS)

	Weekday Afternoon	Weeknight		Weekend
Travel Mode	**Post-Game**	**Pre-Game**	**Post-Game**	**Post-Game**
MUNI Metro	3,444	3,876	1,221	3,153
CalTrain	2,576	749	1,314	964
BART	2,146	1,058	1,858	447
Bus[1]	3,745	3,588	2,708	2,842
Charter Bus	761	748	746	958
Walk[2]	4,658	5,359	817	4,590
Bicycle	375	125	125	475
Taxi	363	459	161	322
Auto Occupants[3]	21,432	23,538	30,550	25,749
Total Persons	39,500	39,500	39,500	39,500

Notes:
1. Primarily MUNI, but also includes AC Transit and Golden Gate Transit.
2. Does not include walk trips from regional and local transit stops or from parking spaces.
3. Includes drivers and all occupants.

Source: Wilbur Smith Associates.

assumed to be 2.0, consistent with the CTBS data for this type of trip, which is more like a commuting trip than a ballpark trip. Additional data regarding local and national ballpark vehicle occupancy rates is provided in Appendix C, Table X.C.8, p. A.122.

SPECIAL EVENTS

As noted previously, this study focuses on the analysis of baseball games at the new ballpark, and evaluates a sellout of the 42,000 seats for weekday afternoon, weekday evening and

TABLE IV.E.8
SUMMARY OF PEAK HOUR BALLPARK TRANSIT DEMAND BY OPERATOR

Operator	Transit Demand By Fans				Transit Demand By Employees				Total Ballpark Transit Demand			
	Weekday Afternoon Post-Game (3:30 - 4:30 p.m.)	Weekday Night Pre-Game (6:30 - 7:30 p.m.)	Weekday Night Post-Game (10:30 - 11:30 p.m.)	Weekend Game Post-Game (4:00 - 5:00 p.m.)	Weekday Afternoon Post-Game (3:30 - 4:30 p.m.)	Weekday Night Pre-Game (6:30 - 7:30 p.m.)	Weekday Night Post-Game (10:30 - 11:30 p.m.)	Weekend Game Post-Game (4:00 - 5:00 p.m.)	Weekday Afternoon Post-Game (3:30 - 4:30 p.m.)	Weekday Night Pre-Game (6:30 - 7:30 p.m.)	Weekday Night Post-Game (10:30 - 11:30 p.m.)	Weekend Game Post-Game (4:00 - 5:00 p.m.)
MUNI - Light Rail	2,926	3,488	1,038	2,837	148	0	70	59	3,074	3,488	1,108	2,896
MUNI - Bus	2,916	3,135	2,145	2,502	156	0	156	53	3,072	3,135	2,301	2,555
BART	1,826	953	1,579	402	94	0	60	18	1,920	953	1,639	420
CalTrain	2,190	674	1,116	868	87	0	36	31	2,277	674	1,152	899
Golden Gate Transit	82	9	14	10	6	0	1	1	88	9	15	11
AC Transit	185	85	142	47	0	0	0	0	185	85	142	47
Total[1]	10,125	8,345	6,035	6,665	490	0	325	160	10,615	8,340	6,360	6,830

Note:
1. Columns may not add to totals due to rounding.

Source: Wilbur Smith Associates.

weekend games. Other types of events may be scheduled at the ballpark. Up to about five days per year, a special major event may occur which exceeds the 42,000-seat capacity through the use of temporary seating. These events might range from music and entertainment presentations to a large civic gathering for the 4th of July or for the visit of a prominent public figure. When such special events occur, impacts on traffic, transit, and parking would be as great as or greater than those identified for a sellout game. This would be particularly true of an event occurring on a weekday afternoon. Also, ballgame starting and ending times were planned to the extent possible to avoid peak travel periods; this may not always be possible with the occasional special event. Scheduling any large event at times which would involve the arrival or departure of large numbers of people during the peak travel period would result in impacts beyond those identified in the transportation impacts analysis.

For example, a special event with an attendance of 50,000 would attract up to 25 percent more patrons than a sellout ballgame if all ticket holders came to the event. The traffic, transit, parking, and pedestrian impacts of such an event would be proportionately greater than those identified below for a sellout ballgame. Traffic delays and congestion, the demand for parking, and the demand for transit services all would increase, and pedestrian flows around the ballpark would be up to 25 percent greater than those associated with sellout games at the ballpark. The impact would be greatest for a large major event on a weekday afternoon. This is the time period when the available transportation resources are already highly utilized and roadway, transit, and parking capacity would be very limited. It would, however, be unlikely that such events would be scheduled on a weekday. On evenings and weekend days, transportation resources are much more available. A major special event in these time periods would require that patrons seek parking beyond the 15-minute walk zone, into the 15 to 20+ minute zone.

These events are likely to be very infrequent. Information provided by the Giants indicates that the new Denver ballpark has never had a large special event; Baltimore's Camden Yards

ballpark has had one since opening in 1992, a visit by the Pope; and Cleveland has had one (a musical concert) since 1994.[23]

Due to the infrequency of special events that would exceed the 42,000 attendance, it is not practical or meaningful to attempt to evaluate all the possible combinations of adverse circumstances which could occur at each type of special event that might be staged at a new ballpark. However, in general, an event with an attendance larger than 42,000 would generate proportionately larger impacts in terms of transit demand, parking, and traffic impacts on local streets and the regional highway network. While the nature of the impact would not be substantially different from that associated with a sellout ballgame, the magnitude of the impact would in many cases be greater. Such special events would require that additional transportation measures be instituted to address the types of impacts identified above. A discussion regarding these measures is included in V.B Transportation and Circulation (p. V.45).

Smaller events may occur more frequently than major events in the ballpark. These could be activities such as classical music concerts or other entertainment events, and some could take place in a temporary amphitheater constructed within the ballpark approximately between first and third base, including lower levels of grandstand seating. Parking would be available in the dedicated parking lots south of the Channel as well as in public and private parking lots north of the Channel, as for baseball games. Such events would attract considerably fewer vehicle and transit trips than have been analyzed for a sold-out baseball game. Most events are assumed to be evening or weekend activities that would generate travel at times other than the p.m. peak commute hour (4:30 to 5:30). Therefore, the impacts of these events would be less than impacts analyzed and described for a baseball game with 39,500 or more fans in attendance.

CUMULATIVE SCENARIO

Cumulative Travel Demand Forecasts

The MTC Regional Travel Model was used to develop the traffic forecasts for cumulative development and growth through the year 2015. The MTC model provides forecasts of traffic on regional freeways and on the study area street network for the year 2015 based upon assumptions of future growth in housing units and employment from *Projections '96* prepared by the Association of Bay Area Governments (ABAG). This model is the best available source of estimates of future traffic under year 2015 cumulative conditions because it considers not just the cumulative growth in the project area, but the overall growth in all of San Francisco, and the related growth in the Bay Area region as a whole.

Cumulative scenario traffic forecasts for all study intersections are established from the MTC model in combination with localized traffic analysis for specific plans and developments in the vicinity of the project site. Growth at the Port, in the Mission Bay planning area, in the Transbay area and the Rincon Point - South Beach Redevelopment Area were all considered and used to adjust the MTC model as appropriate. These developing areas are briefly described below.

The MTC model is intended to be a tool to forecast future traffic volumes on major regional traffic facilities such as the Bay Bridge, I-80, U.S. Highway 101 and I-280. It is not intended to provide accurate traffic forecasts on local streets at the block-by-block level. It also does not provide forecasts of turning movements at intersections which are necessary to determine future intersection traffic conditions.

The results of the year 2015 MTC traffic forecasts are incorporated into the overall year 2015 cumulative analysis by comparing the results of the MTC model with the results of a local area traffic model which included all of the proposed land use developments discussed below, and the approved, but yet to be constructed Gap World Headquarters Building

proposed for a site at Folsom and Steuart Streets in the Rincon Point - South Beach Redevelopment Area. The comparisons are made at the key regional screenlines where the MTC model is known to be most accurate. The results of the local area traffic model are then adjusted until they accurately match the results of the MTC model; the adjusted local area model is used to produce intersection turning movements and street links volumes.

San Francisco Waterfront Land Use Plan

In response to Proposition H, passed by San Francisco voters in 1990, the Port of San Francisco developed a draft plan to guide future land use decisions along the waterfront from India Basin north to Fisherman's Wharf, including the project site. A final environmental impact report on the *Waterfront Land Use Plan* (WLUP) was certified in January 1997. Two development scenarios were created based on allowable land uses for Port properties, to analyze moderate and high levels of growth at the Port in the EIR. The development scenario described as Alternative A in the WLUP DEIR was considered in the cumulative analysis for the ballpark transportation study. It generally represents a moderate-development scenario, with an emphasis on smaller-scale development and local-serving uses, and interim uses such as light industrial, warehousing, and general industrial. A ballpark was included in the WLUP EIR as a variant of the high development scenario (Alternative B).

This EIR for the proposed ballpark does not use WLUP EIR Alternative B because that alternative makes optimistic assumptions about increases in regional shipping activity and about the amount of that activity that will be captured by the Port of San Francisco, assumes substantial changes are made in the Bay Conservation and Development Commission's *Seaport Plan* and in federal cruise ship laws, and assumes substantial capital investment is made by the Port to improve existing marine terminals and create additional terminals and to improve rail access to these terminals. Although appropriate for the Program-level analysis necessary to evaluate environmental impacts of the proposed WLUP covering the entire San

Francisco Bay shoreline, these assumptions make WLUP EIR Alternative B less reasonably forseeable and less appropriate for use in an EIR analyzing the impacts of a single development project on a single site.

Mission Bay

To establish the cumulative context for the ballpark, the *Mission Bay Specific Plan* land uses and zoning were assumed to change to eliminate the designation of office uses north of China Basin Channel, in the area bounded by Townsend, Third, Berry and Sixth Streets. This assumption is consistent with the new conceptual proposal for the area north of the Channel, developed by Catellus Development Corporation in 1996. For the purposes of this study and consistent with the conceptual proposal, development of Mission Bay lands north of the Channel is assumed to result in approximately 3,000 housing units and up to 600,000 square feet (sq. ft.) of retail space, with associated parking, by the year 2015. South of China Basin Channel, the land use plan from the approved 1990 Mission Bay Plan was assumed, except that 2,100 housing units were shifted north of the Channel to be consistent with the conceptual proposal for that area, and 1,000 jobs were shifted from the North of Channel area to South of Channel.

Rincon Entertainment Center

The United States Postal Service (USPS) is considering several development concepts for a site generally bounded by Spear, Harrison, Beale and Folsom Streets, owned by the USPS and Caltrans. An environmental impact report/statement is being prepared jointly with the City and County of San Francisco. The USPS "Alternative D," used in this ballpark EIR in the cumulative context, would have the greatest transportation impacts of the four development options now under consideration by the USPS. Alternative D includes 400 units of housing, 623,000 sq. ft. of office, 235,000 sq. ft. of retail, a 500-room hotel, a multiplex

cinema with up to 6,000 seats and a parking garage for 2,500 to 3,000 cars. The office space total includes the potential to accommodate relocated offices of the Pacific Stock Exchange.

Transbay Terminal Redevelopment Survey Area

The San Francisco Redevelopment Agency and Planning Department are engaged in a planning effort regarding an area in the vicinity of the Transbay Transit Terminal at Mission, First and Fremont Streets, extending south to the freeway and east to Spear Street. A relocated transit station is proposed which would make the existing station site available for alternative land uses. Demolition of the Terminal Separator Structure has made land along Folsom Street available as well. The current concept plan for the Transbay Terminal Redevelopment Survey Area includes 4,300 units of housing, 5,500,000 sq. ft. of office space, 600,000 sq. ft. of educational/cultural uses and 170,000 sq. ft. of retail/entertainment uses.[24] The Rincon Entertainment Center site is within the Transbay Area, although it is not included in the actual Redevelopment Survey Area because the property is owned by the U.S. Postal Service and Caltrans. The land use totals in the concept plan for the Transbay Area include land uses proposed for the Rincon Entertainment Center.

UCSF/Mission Bay 2015 Cumulative Scenario

This scenario addresses the possible inclusion of the University of California, San Francisco (UCSF) expansion in the Mission Bay project area south of the China Basin Channel. Mission Bay is currently one of three sites being considered by UCSF for a major new campus.

Land Use and Employment Assumptions

The UCSF/Mission Bay 2015 cumulative scenario reflects a conceptual land use plan developed by Catellus Development Corporation that is contingent on the inclusion of a UCSF campus. The project description for the UCSF campus was taken directly from the *UCSF Long Range Development Plan EIR*. This EIR provided trip generation and distribution assumptions for the campus for an average weekday population of 9,160 persons, including faculty, research staff, other employees, and visitors.[25]

Development of the other land uses in the Mission Bay South of Channel area was assumed to include a 500-room hotel, 3,000 housing units, 5 million sq. ft. of commercial/light industrial use and 350,000 sq. ft. of retail/entertainment use (see Appendix C, Transportation and Circulation, for additional detail on cumulative employment and land use growth assumptions). Employment for these uses was calculated using the employment densities from the *Mission Bay EIR*.[26] The Commercial/Light Industrial use was treated as 50 percent office and 50 percent Service/Light Industrial/Research Development. These uses would result in a total employment of approximately 24,000 jobs including those from the UCSF campus. This is about 19,000 to 20,000 more jobs than has been projected for 2015 in ABAG *Projections '96*, and therefore provides a larger cumulative growth scenario than the "base" cumulative scenario described beginning on p. IV.105.

Trip Generation

The trip generation for land uses assumed in the UCSF/Mission Bay cumulative scenario for the area south of China Basin Channel, which would include the UCSF campus, is shown in Appendix C, Table X.C.10, p. A.123. The combined uses would generate 17,090 peak hour person trips, resulting in about 8,000 peak hour vehicle trips and 3,200 peak hour transit trips. The trip generation of the UCSF campus would represent about 20 percent of the total trip generation of the proposed land uses in the South of Channel area.

Transportation Improvement

The additional transportation improvements that were assumed beyond those already included in the year 2015 cumulative analysis for the ballpark are similar to those in the *Mission Bay EIR* and would include the following:

- A bridge across China Basin Channel similar to the Owens Street extension and bridge proposed in the Mission Bay EIR; and
- A new street connection between Owens Street and Seventh Street just south of China Basin Channel.

Methodology

The MTC model was re-run, increasing the number of jobs in zone 657 by an additional 21,000 jobs to reflect more growth in Mission Bay, including the new UCSF campus, bringing the total number of jobs in this zone to 24,062. The model already assumed 3,097 housing units in this zone, which is consistent with the proposed land use plan. The results of the MTC model run were then used to adjust the local area traffic assignments at the same regional screenlines used in the original analysis.

PROJECT TRAVEL DEMAND ON NON-GAME DAYS

The traditional transportation planning method was used to determine non-game day travel demand for the proposed project. This four-step planning process consists of trip generation, trip distribution, mode split and trip assignment. Each of these steps is briefly described below.

Trip Generation

The trip generation process defines the number of trips attracted to and from the project site. As shown in Table IV.E.9, the project would generate a total of about 1,240 person trips during the 4:30 - 5:30 p.m. peak hour. Afternoon peak hour person work trip generation related to the project's ancillary land uses was based upon employment data provided by the Giants. Person trip generation for non-work trips during the p.m. peak hour was derived from the *San Francisco Guidelines for Environmental Review of Transportation Impacts*, July 1991 (Guidelines). The daily person trip generation for non-game days, which was derived from multiplying the gross floor area by the daily person trip rate supplied in the Guidelines for each land use type, was multiplied by the p.m. peak hour percentage from the Guidelines.

Trip generation for the proposed project includes the Giants administrative offices (31,000 sq. ft.), restaurant uses totaling 35,000 sq. ft., ground-floor retail space (43,000 sq. ft.), PacBell Center (31,000 sq. ft.) and a broadcast studio (31,000 sq. ft.). The total number of person trips generated by the project is the sum of the person trips generated by each project component.

The directional split of p.m. peak hour trips is the sum of the inbound and outbound person trips for work and non-work trip purposes. The inbound/outbound distribution for work trips and non-work trips was obtained from the Giants and Appendix 2 of the Guidelines, respectively. Conversion of peak hour person trips to peak hour vehicle trips is discussed in the Mode Split subsection, pp. IV.112 - IV.114. Table IV.E.10, p. IV.113, lists the number of person trips by trip purpose.

Trip Distribution

Project trip distribution is developed using regional and local distribution data. Regional trip distribution by place of residence is given in the *Citywide Travel Behavior Survey* (CTBS)

TABLE IV.E.9
NON-GAME DAY PROJECT PERSON TRIP GENERATION SUMMARY BY LAND USE
PM PEAK HOUR (4:30-5:30 p.m.)

Land Use	Size (1,000 sq. ft)	Work Trips[1]	Non-Work Trips[2]		
		Person Trips	Trip Rate[3] (1,000 sq. ft.)	Percent Non-work	Person Trips[4]
Giants Administrative Offices	31	100	1.86	17%	10
Public Restaurant	45[5]	100	27.00	92%	1,118
PacBell Center/Retail Space[6]	74	20	2.01[7]	67%	100
Broadcast Studio	31	80	1.86[8]	17%	10
Total	181	300			1,240

Notes:
1. Based on employment data from Giants October 21, 1996 letter from Jack Bair to WSA and see note 2.
2. Derived from Transportation Impact Guidelines, Appendix 1, July 1991.
3. p.m. peak hour rate = Daily trip rate x p.m. peak hour percent of daily trips.
4. Non-work person trips = Total person trips x non-work percent of all trips (Guidelines).
5. Includes 10,000 sq. ft. of restaurant space open on game days only.
6. Combined retail plus learning center.
7. Guidelines' trip rate for Composite sales/showrooms.
8. Guidelines' trip rate for Primary office.

Source: Wilbur Smith Associates.

and supplemental data provided by the Planning Department based on the CTBS. Local trip distribution is a function of existing travel demand, circulation patterns, site access locations, expected future developments in the area, planned changes in street network and accessibility of transit services. To determine local trip distribution, regional person trip distribution percentages between all origins and destinations are disaggregated and assigned to adjacent streets and freeway ramps in the study area. The one-way street system, freeway access restrictions and unique local travel pattern in the project area lead to distinctly different inbound and outbound project trip distribution assumptions.

Mode Split

The mode split process defines the percentage of person trips made during the peak hour using different modes of transportation. The four categories of travel modes used in this

TABLE IV.E.10
PERSON TRIPS BY TRIP PURPOSE
WEEKDAY PM PEAK HOUR
(NON-GAME DAY)

	Person Trips by Trip Purpose								
	Work			Non-Work			Total Person Trips (All Purpose)		
	In	Out	Total	In	Out	Total	In	Out	Total
Office	0	100	100	5	5	10	5	105	110
Restaurant	50	50	100	559	559	1,118	609	609	1,218
PacBell Center	0	20	20	50	50	100	50	70	120
Studio	0	80	80	5	5	10	5	85	90
Total[1]	50	250	300	620	620	1,240	670	870	1,540

Note:
1. Columns may not add to totals due to rounding.

Source: Letter from Jack Bair, Vice President and General Counsel, San Francisco Giants, to WSA, October 21, 1996; *San Francisco Guidelines for Environmental Review of Transportation Impacts*, July 1991, Appendix 2. Wilbur Smith Associates.

analysis consist of auto, transit, walk, and others. Person trips by travel mode are summarized in Table IV.E.11. During the p.m. peak hour on non-game days, the project would generate a total of about 1,540 person trips including about 875 auto-mode person trips, about 320 transit trips, about 300 walk trips, and about 45 person trips made by other modes (bicycle, taxi, etc.).

Seventy-seven percent of all project trips would be split between auto mode (57 percent) and transit (20 percent). The remaining project trips would be split between all other modes including walking and bicycling.

The peak hour person trips identified in Table IV.E.11 as auto mode are converted to peak hour vehicle trips in Table IV.E.12 using the auto occupancy rates given in the CTBS. Auto occupancy rate is the average number of persons occupying a vehicle. For the purpose of

TABLE IV.E.11
PROJECT PERSON TRIP GENERATION SUMMARY BY TRAVEL MODE
WEEKDAY PM PEAK HOUR
(NON-GAME DAY)

Land Use	Person Trips by Travel Mode				Total Person Trips (All Modes)
	Auto	Transit	Walk	Others	
Office	33	62	8	7	110
Restaurant	742	188	261	27	1,218
Retail	72	19	26	3	120
Studio	27	50	7	6	90
Total[1]	875	320	300	45	1,540

Notes:
1. Columns may not add to totals due to rounding.

Source: Person trips by mode are calculated using *Citywide Travel Behavior Survey*, Tables 15 and 16 plus additional data provided to Wilbur Smith Associates by the City which are also based on the CTBS. Wilbur Smith Associates.

evaluating transit impacts, inbound and outbound transit trips are also presented. In summary, the proposed project would generate a total of 445 vehicle trips (204 in, 241 out) and 319 transit trips (102 in, 217 out) during the p.m. peak hour on non-game days.

Trip Assignment

The trip assignment process defines the roadways which project-generated vehicle trips would use traveling to and from the project site. The route used during the peak hour depends on the proposed parking provisions, access locations, turn restrictions, and the origin and destination.

TABLE IV.E.12
NON-GAME DAY VEHICLE AND TRANSIT TRIP GENERATION SUMMARY
(WEEKDAY PM PEAK HOUR)

	Vehicle Trips			Transit Trips		
Land Use	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Office	2	22	24	1	61	62
Restaurant	183	183	366	94	94	188
Retail	17	19	36	6	13	19
Studio	2	17	19	1	49	50
Total	204	241	445	102	217	319

Note:
Auto vehicle trips are less than auto person trips due to consideration of the average number of persons per vehicle due to carpools and vanpools.

Source: Person trips by mode are calculated using *Citywide Travel Behavior Survey* Tables 15, 16 and 35 plus additional data provided to WSA by the City which are also based on the CTBS. Wilbur Smith Associates.

PROJECT TRAFFIC IMPACTS

This section identifies significant traffic impacts associated with the project under existing-plus-project and cumulative conditions. Included in this section are analyses of traffic operating conditions at study area freeway segments, ramps, arterial streets and intersections. As noted earlier, the assumptions used to estimate the traffic impacts of the project are conservative in that project-related traffic was added directly to the volumes of existing traffic on study area streets and freeways, with no consideration as to whether some existing traffic would divert to other routes, travel modes or time periods to avoid ballpark traffic.

Freeway Impacts

The freeway analysis discusses traffic impacts on freeway segments that would be affected by traffic from the ballpark. Segments of U.S. 101 near 3Com Park are congested due to ballgame traffic under existing conditions; this congestion would, in effect, move north, and

much would shift to I-280 because there are two on- and off-ramps from that freeway to the ballpark site and to dedicated parking south of the Channel (at Fifth Street and at Mariposa Street). Some ballpark traffic would still use U.S. 101, and traffic congestion on the U.S. 101 freeway segment south of the Cesar Chavez ramps is analyzed for project traffic.

Existing-plus-Project

The freeway traffic which is forecast to be generated by the project was added to the observed existing traffic volumes for the weekday afternoon game (3:30 - 4:30 p.m.), weekday night games (6:30 - 7:30 p.m.; 10:30 - 11:30 p.m.) and weekend day game conditions (4:00 - 5:00 p.m.). The results are summarized below and quantified in Table IV.E.13. The primary impacts occur after a weekday afternoon game (3:30 - 4:30 p.m.), when ballpark traffic is added to already high levels of traffic on freeways outbound from San Francisco.

Westbound I-80 - The project would cause some change in traffic volumes on westbound I-80 during the 6:30 - 7:30 p.m. weekday travel to night ballgames, with existing LOS C changing to LOS D. At all other study time periods westbound I-80 would remain at LOS D or better.

Eastbound I-80/Bay Bridge - After a weekday afternoon game, the level of service on eastbound I-80/Bay Bridge would decline from LOS E to LOS F, indicating an earlier start to the afternoon commute peak period on the Bay Bridge. Traffic congestion on the approaches to the Bay Bridge would worsen, resulting in a longer duration of time that vehicles are queued on key approaches, including First, Second and Fifth Streets. Project-generated traffic would push existing LOS D conditions toward capacity at LOS E after weekend day (4:00 - 5:00 p.m.) games.

TABLE IV.E.13 ●
SUMMARY OF PROJECT FREEWAY CONDITIONS

Freeway Segments	Weekday Afternoon[1] 3:30-4:30 p.m. VC/LOS[2] Existing[3]	Weekday Afternoon[1] 3:30-4:30 p.m. VC/LOS[2] Existing Plus Project	Weekday Afternoon[1] 3:30-4:30 p.m. VC/LOS[2] Cumulative Plus Project	Weekday Night 6:30-7:30 p.m. VC/LOS[2] Existing[3]	Weekday Night 6:30-7:30 p.m. VC/LOS[2] Existing Plus Project	Weekday Night 6:30-7:30 p.m. VC/LOS[2] Cumulative Plus Project	Weekday Night 10:30-11:30 p.m. VC/LOS[2] Existing[3]	Weekday Night 10:30-11:30 p.m. VC/LOS[2] Existing Plus Project	Weekday Night 10:30-11:30 p.m. VC/LOS[2] Cumulative Plus Project	Weekend Day 4:00-5:00 p.m. VC/LOS Existing[3]	Weekend Day 4:00-5:00 p.m. VC/LOS Existing Plus Project	Weekend Day 4:00-5:00 p.m. VC/LOS Cumulative Plus Project
U.S. 101 South of Third St.												
▸ Northbound	0.69/D	0.69/D	0.78/D	0.66/D	0.81/E	0.90/E	0.32/B	0.32/B	0.35/B	0.32/B	0.32/B	0.42/B
▸ Southbound*	0.76/D	1.00/E	1.10/F	0.58/C	0.58/C	0.60/D	0.30/B	0.65/D	0.73/D	0.65/D	0.89/E	0.99/E
U.S. 101 North of Cesar Chavez St.												
▸ Northbound	0.75/D	0.75/D	0.80/D	0.66/D	0.70/D	0.75/D	0.42/B	0.42/B	0.43/C	0.75/D	0.75/D	0.81/E
▸ Southbound	0.92/E	0.98/E	1.02/F	0.81/E	0.81/E	0.86/E	0.52/C	0.63/D	0.67/D	0.86/E	0.92/E	0.97/E
I-280 South of Mariposa St.												
▸ Northbound*	0.56/C	0.56/C	0.64/D	0.45/C	0.66/D	0.75/D	0.26/B	0.26/B	0.28/B	0.15/A	0.15/A	0.24/A
▸ Southbound*	0.56/C	0.87/E	0.95/E	0.38/B	0.38/B	0.45/C	0.12/A	0.52/C	0.59/C	0.41/B	0.71/D	0.78/D
I-80/Bay Bridge-SF/Alameda County Line												
▸ Eastbound	0.95/E[4]	1.10/F	1.13/F	0.86/E	0.86/E	0.89/E	0.58/C	0.79/D	0.83/E	0.73/D	0.89/E	0.92/E
▸ Westbound	0.73/D	0.73/D	0.76/D	0.62/C	0.74/D	0.89/E	0.33/B	0.33/B	0.34/B	0.75/D	0.75/D	0.79/D

Notes: Capacity is 2,200 vehicles per lane per hour (vplph), except weaving sections which are 1,900 vplph.
(See *Highway Capacity Manual*, 1994, Table 4-5.)

1. VC = Volume-to-Capacity Ratios / LOS = Level-of-Service.
2. Existing traffic volumes have been redistributed to account for roadway improvements under construction, completed by 2000.
3. LOS E based on 1995/96 SFCTA/Caltrans travel speed data.
* Weaving Section.

Source: Wilbur Smith Associates.

U.S. 101 - The project would cause LOS D to worsen to LOS E on southbound U.S. 101 south of Third Street after weekday afternoon and weekend games at the ballpark. During all other study time periods, southbound U.S. 101 would remain at LOS E or operate at LOS D or better although increased traffic might be noticeable in some locations.

The project would cause the level of service on northbound U.S. 101 to deteriorate from LOS D to LOS E in the area south of the Third Street exit before a weekday night game. All other LOS and traffic volumes would remain the same or similar to existing conditions.

I-280 - After weekday afternoon games, traffic conditions on southbound I-280 would worsen from existing LOS C to LOS E. During all other study time periods, LOS D or better would be maintained.

Cumulative-plus-Project

The year 2015 cumulative context scenario consists of the areawide growth predicted by the MTC model, adjusted for current plans for the Port, in the Mission Bay planning area, in the Transbay area and the Rincon Point - South Beach Redevelopment Area.

The freeway traffic which is forecast to be generated by the project was added to cumulative background traffic volumes for the afternoon post-game, weeknight pre- and post-game, and weekend post-game conditions. The results are shown in Table IV.E.13. As with the existing-plus-project scenarios, the primary impacts occur after a weekday afternoon game, when ballpark traffic is added to already high levels of traffic on freeways outbound from San Francisco.

Westbound I-80 - During the hour before weekday night games (6:30 - 7:30 p.m.), the level of service compared to existing-plus-project would worsen from LOS D to LOS E under cumulative-plus-project conditions in the westbound direction.

Eastbound I-80/Bay Bridge - Compared to existing-plus-project conditions, cumulative-plus-project traffic would decrease the level of service in the eastbound direction from LOS D to LOS E during the hour after weekday night games (10:30 - 11:30 p.m.).

U.S. 101 - Compared with existing-plus-project conditions, the cumulative-plus-project traffic would cause the level of service to degrade further, from LOS E to LOS F in the southbound direction south of Third Street and north of Cesar Chavez Street during the hour after weekday afternoon games (3:30 - 4:30 p.m.).

I-280 - Cumulative traffic would not cause any further significant impacts at any I-280 locations south of Mariposa Street during all study time periods.

Non-Game Day Scenario

Weekday (4:30 - 5:30 p.m.) peak hour (non-game day) freeway conditions are shown in Table IV.E.14. On a non-game day, the p.m. peak hour level of service on westbound I-80 would decline from existing LOS E to LOS F with project-generated traffic from employees and patrons of the restaurant and retail uses on the ballpark site. While the freeway cumulative scenario could be assumed to include project non-game travel, the analysis instead is conservative and adds project non-game travel to cumulative traffic forecasts. This cumulative-plus-project analysis results in further degradation from LOS E to LOS F during the p.m. peak hour on U.S. 101 southbound from I-80 to south of Third Street.

Cumulative UCSF/Mission Bay 2015 Scenario

Game Day Freeway Impacts

The year 2015 UCSF/Mission Bay cumulative scenario includes the developments included in the "base" year 2015 cumulative scenario. In addition, there would be a new campus for

TABLE IV.E.14
SUMMARY OF NON-GAME DAY PROJECT FREEWAY CONDITIONS

Freeway Segments	Weekday Night 4:30-5:30 p.m. VC/LOS[1] Existing[2]	Existing Plus Project	Cumulative Plus Project
U.S. 101 South of Third St.			
▸ Northbound	0.88/E	0.89/E	0.99/E
▸ Southbound (weaving section)	0.94/E	0.95/E	1.03/F
U.S. 101 North of Cesar Chavez St.			
▸ Northbound	0.78/F[3]	0.78/F[4]	0.84/F[4]
▸ Southbound	1.00/E	1.00/E	1.05/F
I-280 South of Mariposa St.			
▸ Northbound (weaving section)	0.58/C	0.59/D	0.68/D
▸ Southbound (weaving section)	0.72/D	0.72/D	0.79/D
I-80/Bay Bridge-SF/Alameda County Line			
▸ Eastbound	0.98/E	0.98/E	1.00/E
▸ Westbound	1.00/E	1.02/F	1.04/F

Note:
Capacity is 2,200 vehicles per lane per hour (vplph), except weaving sections which are 1,900 vplph. (See *Highway Capacity Manual*, 1994, Table 4-5.)

1. VC = Volume-to-Capacity Ratios / LOS = Level-of-Service
2. Existing traffic volumes have been redistributed to account for roadway improvements that are under construction.
3. LOS F based on travel time runs, reflecting effect of a queue from downstream bottleneck at U.S. 101/I-80 Interchange.
   Existing Demand/Capacity exceeds 1.0.
4. LOS F created by queue from the U.S. 101/I-80 Interchange.

Source: Wilbur Smith Associates.

UCSF, a 500-room hotel, 3,000 housing units, 5 million sq. ft. of commercial/light industrial use, and 350,000 sq. ft. of retail/entertainment uses.

The freeway traffic which is forecast to be generated by these additional UCSF/Mission Bay developments was added to cumulative-plus-project traffic volumes for the weekday afternoon

post-game, weeknight pre- and post-game, and weekend post-game conditions. The results are shown in Table IV.E.15.

Westbound I-80 - During the hour after weekend games (Saturday, 4:00 - 5:00 p.m.), the level of service compared to base cumulative-plus-project would worsen from LOS D to LOS E under UCSF/Mission Bay 2015 cumulative conditions.

U.S. 101 - Compared with base cumulative conditions in 2015, the UCSF/Mission Bay cumulative traffic would further deteriorate the level of service from LOS D to LOS E in the northbound direction north of Cesar Chavez Street and south of Third Street during the hour after weekday afternoon games (3:30 - 4:30 p.m.). During the hour before weekday night games (6:30 - 7:30 p.m.), the level of service on southbound U.S. 101 south of Third Street would deteriorate further from LOS D to LOS E. The level of service at this location would deteriorate from LOS E to LOS F during the hour after weekend games (4:00 - 5:00 p.m.).

I-280 - The UCSF/Mission Bay cumulative-plus-project traffic would cause the level of service on southbound I-280 south of Mariposa Street to deteriorate from LOS E under base cumulative-plus-project conditions to LOS F during the hour after weekday afternoon games (3:30 - 4:30 p.m.) and from LOS D to LOS E during the hour after weekend games (4:00 - 5:00 p.m.). During the hour before weekday night games (6:30 - 7:30 p.m.), the level of service in the northbound direction of I-280 south of Mariposa Street would deteriorate from LOS D under the base cumulative conditions to LOS E.

Non-Game Day Freeway Impacts

Weekday (4:30 - 5:30 p.m.) peak hour (non-game day) freeway conditions are shown in Table IV.E.16. On a non-game day, the base cumulative-plus-project p.m. peak hour level of service would decline from LOS E to LOS F on eastbound I-80 with the UCSF/Mission Bay 2015 cumulative traffic. On southbound I-280 south of Mariposa Street, the level of

TABLE IV.E.15 ●
UCSF/MISSION BAY CUMULATIVE + PROJECT FREEWAY CONDITIONS

Freeway Segments	Weekday Afternoon 3:30-4:30 PM		Weekday Night 6:30-7:30 PM		Weekday Night 10:30-11:30 PM		Weekend Day 4:00-5:00 PM	
	VC/LOS Base Cumulative Plus Project	VC/LOS UCSF Cumulative Plus Project	VC/LOS Base Cumulative Plus Project	VC/LOS UCSF Cumulative Plus Project	VC/LOS Base Cumulative Plus Project	VC/LOS UCSF Cumulative Plus Project	VC/LOS Base Cumulative Plus Project	VC/LOS UCSF Cumulative Plus Project
U.S. 101 South of Third St.								
▸ Northbound	0.78/D	0.86/E	0.90/E	0.96/E	0.35/B	0.37/B	0.42/B	0.48/C
▸ Southbound (weaving section)	1.10/F	1.35/F	0.60/D	0.87/E	0.73/D	0.76/D	0.99/E	1.02/F
U.S. 101 North of Cesar Chavez St.								
▸ Northbound	0.80/D	0.84/E	0.75/D	0.78/D	0.43/C	0.45/C	0.81/E	0.84/E
▸ Southbound	1.02/F	1.14/F	0.86/E	0.93/E	0.67/D	0.68/D	0.97/E	0.99/E
I-280 South of Mariposa St.								
▸ Northbound (weaving section)	0.64/D	0.71/D	0.75/D	0.81/E	0.28/B	0.31/B	0.24/A	0.30/B
▸ Southbound (weaving section)	0.95/E	1.14/F	0.45/C	0.64/D	0.59/C	0.61/C	0.78/D	0.81/E
I-80/Bay Bridge-SF/Alameda County Line								
▸ Eastbound	1.13/F	1.19/F	0.89/E	0.95/E	0.83/E	0.84/E	0.92/E	0.93/E
▸ Westbound	0.76/D	0.80/D	0.89/E	0.94/E	0.34/B	0.35/B	0.79/D	0.82/E

Notes:
Capacity is 2,200 vehicles per lane per hour (vplph), except weaving sections which are 1,900 vplph.
(See *Highway Capacity Manual*, 1994, Table 4-5.)
VC = Volume-to-Capacity Ratios.
LOS = Level-of-Service.

Source: Wilbur Smith Associates.

TABLE IV.E.16
SUMMARY OF NON-GAME DAY PROJECT FREEWAY CONDITIONS
UCSF/MISSION BAY CUMULATIVE + PROJECT

Freeway Segments	Weekday Afternoon 4:30-5:30 p.m. VC/LOS[1] Base Cumulative Plus Project	Weekday Afternoon 4:30-5:30 p.m. VC/LOS[1] UCSF Cumulative Plus Project
U.S. 101 South of Third St.		
▸ Northbound	0.99/E	1.05/F
▸ Southbound (weaving section)	1.03/F	1.23/F
U.S. 101 North of Cesar Chavez St.		
▸ Northbound	0.84/F[2]	0.87/F[2]
▸ Southbound	1.05/F	1.12/F
I-280 South of Mariposa St.		
▸ Northbound (weaving section)	0.68/D	0.75/D
▸ Southbound (weaving section)	0.79/D	0.98/E
I-80/Bay Bridge-SF/Alameda County Line		
▸ Eastbound	1.00/E	1.06/F
▸ Westbound	1.04/F	1.08/F

Notes:
Capacity is 2,200 vehicles per lane per hour (vplph), except weaving sections which are 1,900 vplph. (See *Highway Capacity Manual*, 1994, Table 4-5.)
1. VC = Volume-to-Capacity Ratios / LOS = Level-of-Service
2. LOS F created by queue from the U.S. 101/I-80 Interchange.

Source: Wilbur Smith Associates.

service would also decline from LOS D to LOS E. The additional traffic generated by the UCSF/Mission Bay 2015 cumulative development would cause the level of service to degrade from LOS E to LOS F in the northbound direction on U.S. 101 south of Third Street.

Freeway Ramp Impacts

Existing-plus-Project

Project impacts at primary freeway on- and off-ramps serving the study area would be distributed among several ramps connecting with I-80, the King Street and Sixth Street ramps connecting with I-280, and the Mariposa Street ramps connecting with I-280. Where freeway ramps form intersections with local streets, the impacts at the ramp are analyzed in the intersection discussion later in this section beginning on p. IV.144. While the project would increase traffic at all freeway ramps during all time periods studied, this study focuses on ramp locations where there would be a queuing problem at and near the ramp. Under free-flow conditions on the freeway, such as on U.S. 101 following a weeknight game, on-ramps would not experience any delay and project traffic would have minimal impacts on the ramp itself. The most substantial impacts would generally occur during the 3:30 - 4:30 p.m. hour; ballpark traffic would overlap with existing peak hour traffic after weekday afternoon games.

Based on field observations, the eastbound on-ramps to I-80/Bay Bridge and westbound on-ramp to I-80/U.S. 101 at Fourth and Harrison Streets have severe queuing problems in the p.m. peak period.[27] Vehicle queues usually "spill" back from the ramp to all approaches leading to the freeway on-ramp. Project impacts at these ramp locations are discussed below. Table IV.E.17 shows the impact of project traffic on these congested freeway ramps, showing additional queue length in each approach caused by additional project traffic.

Essex Street On-Ramp to Eastbound I-80/Bay Bridge - Access to this ramp is directly from eastbound Harrison Street and indirectly from eastbound Folsom Street and both directions of Second Street. A portion of project traffic destined for the Bay Bridge is forecast to use this ramp after games. Existing weekday afternoon queue lengths would be longer with the project in the 3:30 to 4:30 time period after a weekday afternoon sellout baseball game.

TABLE IV.E.17 ●
SUMMARY OF I-80 FREEWAY RAMP IMPACTS

I-80 On-Ramp	Weekday Queue Length Increase[1]			
	3:30-4:30 p.m.[2] Existing Plus Project	6:30-7:30 p.m. Existing Plus Project	3:30-4:30 p.m. Cumulative Plus Project	6:30-7:30 p.m. Cumulative Plus Project
Fifth/Bryant	NB = 100' EB = 0' SB = 100'	0[3]	NB = 200' EB = 500' SB > 5,000'[4]	NB = 0' EB = 300' SB = 0'
Essex/Harrison	EB >5,000' SB = 100'	0	EB > 5,000' SB = 100'	EB = 200' SB = 0'
First/Harrison	SB = 300' WB = 300'	SB = 0 WB = 1,000'	SB = 400' WB = 4,500'	SB = 0' WB = 1,500'
Fourth/Harrison	SB = 100' WB =3,500'	0	SB = 500' WB > 5,000'	SB = 300' WB = 1,000'

Notes:
Queue length less than 500' rounded to the nearest 100', otherwise 500'.
1. Increase as compared to existing conditions.
2. "0" indicates a minimal change in queue length.
3. The model does not calculate the exact queue length when the queue exceeds 5,000 feet.

Source: Wilbur Smith Associates.

The queue length in the eastbound direction would increase by more than 5,000 ft. The impact during other study time periods would be minimal.

First and Harrison Streets On-Ramp to Eastbound I-80/Bay Bridge - Existing weekday afternoon congestion approaching this ramp extends along Harrison Street east to The Embarcadero and on First Street north several blocks, sometimes to Market Street. The addition of project traffic after weekday baseball games (3:30 - 4:30 p.m.) would lengthen the queue in the westbound direction and southbound direction by 300 ft. Before weekday

night games, in the 6:30 - 7:30 p.m. period, project traffic would lengthen the queue in the westbound direction by about 1,000 ft. due to ballpark-bound cars exiting from the Bay Bridge at the Harrison Street off-ramp and turning left onto westbound Harrison Street to reach Second or Third Streets and access to parking lots north or south of the Channel. At 6:30 p.m. project traffic using this off-ramp could encounter queues of cars heading for the Bay Bridge left over from the peak commute period and would add to those queues. Queuing impacts after weekday night and weekend day games would be minimal.

Fourth and Harrison Streets On-Ramp to Westbound I-80 - Existing weekday afternoon (3:30 - 4:30 p.m.) congestion approaching this ramp extends along Harrison Street east of Fourth Street and on Fourth Street north to Folsom Street. The addition of project traffic after weekday afternoon baseball games would lengthen the queue in the southbound direction by 100 ft. and westbound direction by 3,500 ft. Queuing impacts before and after weekday night games and after weekend day games would be minimal.

Fifth and Bryant Streets On-Ramp to Eastbound I-80/Bay Bridge - Existing weekday afternoon (3:30 - 4:30 p.m.) congestion extends on Fifth Street in both directions and on Bryant Street west to Sixth Street. The addition of project traffic would lengthen the queue by 100 ft. in the northbound and southbound directions. These increased queue lengths would cause minimal impacts as they would add approximately four cars to the queue over the one-hour analysis time. Impacts to vehicle queues after weekday night and weekend day games would be minimal.

Sterling Street On-Ramp to Eastbound I-80/Bay Bridge - Use of this ramp is currently restricted to high-occupancy vehicles (HOV) from 3:30 to 7:00 p.m. on weekdays. In January 1996, the San Francisco Board of Supervisors selected the "DPT Variant" as the preferred alternative for replacement of the Mid-Embarcadero roadway and terminal separator ramps. The preferred alternative includes removing the HOV restriction from the Sterling Street ramp and imposing HOV restrictions at the Essex Street on-ramp to the Bay Bridge in the future if congestion levels warrant such a change. Although there are vehicle queues on Second Street near the Sterling

Street ramp on weekday afternoons, the queues are not created by excess demand on the Sterling Street ramp. Instead, the congestion is created by excess demand for the Essex Street on-ramp further to the north. The resulting queues, however, extend south on Second Street and typically block the Bryant/Second Street intersection.

Even with the current HOV restriction on the Sterling Street on-ramp, a high percentage of project traffic after weekday afternoon games would have three or more occupants per vehicle and would be able to use the Sterling Street on-ramp. This would allow ballgame traffic to avoid the congested Essex Street ramp to I-80.

I-280 Ramps - I-280 off-ramps (both Fourth and Sixth Street ramps) were not analyzed because project traffic would only affect off-ramps under pre-game conditions (6:30 - 7:30 p.m.) during which queuing conditions are usually not bad. Further, queuing on an off-ramp is directly related to how the intersection operates, which is discussed in the subsection on intersections, below (beginning on p. IV.144). Unlike the I-80 (Bay Bridge) ramps, queuing near I-280 on-ramps (e.g., Brannan and Sixth Streets) is not a consequence of poor operating conditions on the freeway itself. Rather, it is directly related to the intersection operation, and details are discussed in the subsection on intersections.

Other Ramps - As noted above, the impacts of the project would include increased traffic on I-280 and U.S. 101, and on the on-ramps and off-ramps serving these freeways in the study area during hours before and after ballgames. One potential result of this increased congestion and delay would be an increased incentive for traffic to use neighborhood streets in the vicinity of the ramps at Vermont, Mariposa, Pennsylvania and Cesar Chavez Streets. Generally, I-280 would not experience congestion before and after ballpark events; consequently it is not expected that ballgames would stimulate a substantial diversion of traffic onto neighborhood streets from Mariposa and Pennsylvania Streets. Traffic conditions on U.S. 101, which are already congested during many of the study time periods, would worsen. This could result in increased use of the ramps at Vermont and Cesar Chavez Streets, creating the potential for diversion of both ballpark and non-ballpark traffic onto

neighborhood streets in these areas. There is also capacity, however, to divert much of this traffic to I-280. Because capacity would be available on I-280, impacts on the Vermont and Cesar Chavez Street ramps related to congestion on I-80/U.S. 101 is not considered to be a likely result of ballgame traffic.

Cumulative-plus-Project

Cumulative-plus-project impacts at primary freeway on- and off-ramps result in increased vehicle queues at ramps serving the study area (see pp. IV.105 - IV.108 for a general discussion of developments included in the cumulative travel forecast). Table IV.E.17, p. IV.125, shows the estimated queue length increases relative to existing operations at the ramps. The most substantial impacts are forecast during the 3:30 - 4:30 p.m. period after weekday afternoon games.

Essex Street On-Ramp to Eastbound I-80/Bay Bridge - As previously noted, existing vehicle queues extend past the intersection of Essex Street and Harrison Street on weekdays from 4:00 to 7:00 p.m. Under cumulative-plus-project conditions, weekday afternoon queue lengths would be longer (by over 5,000 ft.) on the eastbound approach in the 3:30 to 4:30 p.m. time period after a weekday afternoon baseball game. During the 6:30 - 7:30 p.m. period, before weekday night ballgames, cumulative-plus-project traffic would lengthen the queue in the eastbound direction by about 200 ft. Queue lengths before a weekday night game would not change significantly.

First and Harrison Streets On-Ramp to Eastbound I-80/Bay Bridge - As noted, existing weekday afternoon congestion approaching this ramp extends along Harrison Street east to The Embarcadero and on First Street north sometimes to Market Street. The addition of project traffic under cumulative conditions during the weekday afternoon would lengthen the queue in the westbound approach by over 4,500 ft. Cumulative-plus-project traffic would add a queue of 1,500 ft. to the westbound approach during the pre-night game time period

(6:30 -7:30 p.m.) and inbound ballpark traffic would be using westbound Harrison Street to reach Second and Fourth Streets. Impacts after night and weekend games would be minimal in terms of vehicle queuing.

Fourth and Harrison Streets On-Ramp to Westbound I-80 - Existing weekday afternoon congestion at this ramp extends along Harrison Street east of Fourth Street and on Fourth Street north to Folsom Street. The addition of project and cumulative traffic after weekday afternoon baseball games would lengthen the queue on the westbound approach by more than 5,000 ft. During the hour before a night game (6:30 - 7:30 p.m.), cumulative-plus-project traffic would increase the queue in the westbound approach by 1,000 ft. because the cumulative peak hour for background traffic would extend into this study time period and Fourth Street would be a major ballpark access route. Impacts after weekday night and weekend day games would be minimal.

Fifth and Bryant Streets On-Ramp to Eastbound I-80/Bay Bridge - Weekday afternoon congestion currently extends on Fifth Street in both directions and on Bryant Street west to Sixth Street. The addition of project and cumulative traffic would lengthen the queue in the southbound approach by over 5,000 ft. after a weekday afternoon game. Cumulative-plus-project traffic would add about 300 ft. of queue in the eastbound direction during the hour before weekday night games (6:30 - 7:30 p.m.). Impacts after night and weekend games would be minimal in terms of vehicle queuing.

Non-Game Day Scenario

Weekday (4:30-5:30 p.m.) peak hour (non-game day) freeway ramp conditions are shown in Table IV.E.18. Major increases in queue length would be expected at all of the ramps as a result of the overall cumulative growth without the project at most locations, compared to

TABLE IV.E.18
WEEKDAY NON-GAME DAY
SUMMARY OF I-80 RAMP IMPACTS

I-80 On-Ramp	Queue Length Increase[1] Existing + Project 4:30-5:30 p.m.	Queue Length Increase[1] Cumulative + Project 4:30-5:30 p.m.
Fifth/Bryant	NB = 0'[2]	NB = 0'
	EB = 0'	EB = 1,000'
	SB = 0'	SB = 2,500'
Essex/Harrison	SB = 0'	SB = 100'
	EB = 0'	EB = 2,500'
First/Harrison	SB = 0'	SB = 100'
	WB = 100'	WB = 1,000'
Fourth/Harrison	SB = 0'	SB = 1,000'
	WB = 200'	WB > 5,000'[3]

Note:
Queue length less than 500' rounded to the nearest 100', otherwise 500'.
1. Increase as compared with existing conditions.
2. "0" indicates a minimal change in queue length.
3. The model does not calculate the exact queue length when the queue exceeds 5,000 feet.

Source: Wilbur Smith Associates.

existing conditions. However, the project-related non-game day traffic alone would cause a short additional queue (about 200 ft.) at the westbound approach to the Fourth and Harrison on-ramp. Cumulative-plus-project conditions on non-game days during the 4:30 - 5:30 p.m. period are discussed below for each ramp.

Essex Street On-Ramp to Eastbound I-80/Bay Bridge - The queue length would increase by 2,500 ft. on the eastbound approach, compared to existing queues.

First and Harrison Streets On-Ramp to Eastbound I-80/Bay Bridge - The queue length would increase by 1,000 ft. on the westbound approach.

Fourth and Harrison Streets On-Ramp to Westbound I-80 - The queue length would increase by over 5,000 ft. on the westbound approach and 1,000 ft. on the southbound approach.

Fifth and Bryant Streets On-Ramp to Eastbound I-80/Bay Bridge - The queue length would increase by 2,500 ft. on the southbound approach and 1,000 ft. on the eastbound approach.

UCSF/Mission Bay 2015 Cumulative Scenario

Freeway Ramp Impacts

Additional traffic generated by the UCSF/Mission Bay 2015 cumulative scenario would result in increased vehicle queues at ramps serving the study area. Table IV.E.19 shows the estimated queue length increases relative to existing operations at the ramps under both the base 2015 cumulative and UCSF/Mission Bay 2015 cumulative conditions.

Essex Street On-Ramp to Eastbound I-80/Bay Bridge - The UCSF/Mission Bay 2015 scenario would add more traffic to this already congested ramp, thereby extending vehicle queues by 5,000 ft. beyond existing queues in the eastbound direction during the hour after weekday afternoon games (3:30 - 4:30 p.m.). During the hour before weekday night games (6:30 - 7:30 p.m.), the queue in the eastbound approach would increase from 200 ft. under cumulative-plus-project conditions to over 2,000 ft. with UCSF/Mission Bay cumulative traffic. Impacts after weekday night and weekend day games would be minimal in terms of vehicle queuing.

First and Harrison Streets On-Ramp to Eastbound I-80/Bay Bridge - As noted previously, vehicle queues would already extend an additional 4,500 ft. at the westbound approach during the hour after weekday afternoon games (3:30 - 4:30 p.m.) due to cumulative growth plus ballgame traffic; UCSF/Mission Bay cumulative growth would not substantially extend the queue. In the westbound approach during the hour before weekday night games

TABLE IV.E.19 ●
SUMMARY OF I-80 FREEWAY RAMP IMPACTS
UCSF/MISSION BAY CUMULATIVE PLUS PROJECT CONDITIONS

I-80 On-Ramp	Queue Length Increase[1] 3:30-4:30 p.m.[2] Base Cumulative Plus Project	6:30-7:30 p.m. Base Cumulative Plus Project	3:30-4:30 p.m.[2] UCSF Cumulative Plus Project	6:30-7:30 p.m. UCSF Cumulative Plus Project
Fifth/Bryant	NB = 200' EB = 500' SB > 5,000'[4]	NB= 0'[3] EB= 300' SB= 0'	NB = 300' EB = 2,000' SB > 5,000'	NB = 0' EB = 1,500' SB = 0'
Essex/Harrison	EB > 5,000' SB = 100'	EB=200' SB= 0'	EB > 5,000' SB = 200'	EB = 2,000' SB = 0'
First/Harrison	SB = 400' WB = 4,500'	SB= 0' WB=1,500'	SB = 400' WB = 4,500'	SB = 0' WB = 2,000'
Fourth/Harrison	SB = 500' WB > 5,000'	SB= 300' WB=1,000'	SB = 800' WB > 5,000'	SB = 500' WB = 2,500'

Notes: Queue length less than 500' rounded to the nearest 100', otherwise 500'.
1. Compared with existing conditions.
2. "0" indicates a minimal change in queue length.
3. The model does not calculate the exact queue length when the queue exceeds 5,000 feet.

Source: Wilbur Smith Associates.

(6:30 - 7:30 p.m.), base cumulative-plus-project traffic would extend the queue by 1,500 ft.; additional traffic generated by UCSF/Mission Bay development would extend these vehicle queues by 2,000 ft. compared to existing conditions. Impacts after weekday night and weekend day games would be minimal in terms of vehicle queuing.

Fourth and Harrison Streets On-Ramp to Westbound I-80 - Under base cumulative-plus-project conditions in 2015, vehicle queues on the westbound approach at this intersection would already extend beyond 5,000 ft. during the hour after weekday afternoon games; although UCSF/Mission Bay cumulative growth could add cars to this queue, back-ups of over 5000 ft. cannot be modeled. UCSF/Mission Bay cumulative traffic would add more

vehicles to existing queues, increasing the queue length from 1,000 ft. in cumulative-plus-project conditions to about 2,500 ft. over existing conditions in the westbound direction and from 300 ft. to about 500 ft. in the southbound direction before weekday night games. After weekday afternoon games, queues on the westbound approach could extend beyond 5,000 ft. and on the southbound approach would grow from 500 ft. longer under cumulative-plus-project conditions to 800 ft. longer than existing conditions. Queues after weekday afternoon games could extend far enough east to blend with queues leading to the First and Harrison Streets on-ramp, although drivers are likely to seek other routes to access the freeway if they encounter queues as long as 5,000 ft.

Fifth and Bryant Streets On-Ramp to Eastbound I-80/Bay Bridge - During the hour after weekday afternoon games (3:30 - 4:30 p.m.), traffic generated by UCSF/Mission Bay cumulative development with the project would increase the queue length at this intersection. Compared with base cumulative-plus-project conditions in 2015, the vehicle queue in the northbound direction would increase from 200 ft. to about 300 ft., while the queue in the eastbound direction would extend 2,000 ft. The queue in the southbound direction could extend to or beyond Market Street on Fifth Street under base cumulative-plus-project conditions in 2015, and would be at least as long in the larger UCSF/Mission Bay scenario. During the hour before weekday night games (6:30 - 7:30 p.m.), the queue in the eastbound direction would extend to 1,500 ft.

Non-Game Day Scenario

Weekday (4:30 - 5:30 p.m.) peak hour (non-game day) freeway ramp conditions under UCSF/Mission Bay cumulative conditions are shown in Table IV.E.20. Queuing conditions at each ramp under the base cumulative-plus-project and UCSF/Mission Bay 2015 cumulative-plus-project scenarios are discussed below.

TABLE IV.E.20
WEEKDAY NON-GAME DAY (4:30 - 5:30 p.m.)
UCSF/MISSION BAY CUMULATIVE+ PROJECT CONDITIONS
SUMMARY OF I-80 RAMP IMPACTS

I-80 On-Ramp	Queue Length Increase[1]: Base Cumulative Plus Project 4:30-5:30 p.m.	Queue Length Increase[1]: UCSF Cumulative Plus Project 4:30-5:30 p.m.
Fifth/Bryant	NB = 0' EB = 1,000' SB = 2,500'	NB = 200' EB = 1,500' SB = 2,500'
Essex/Harrison	SB = 100' EB = 2,500'	SB = 100' EB > 5,000'
First/Harrison	SB = 100' WB = 1,000'	SB = 100' WB = 1,000'
Fourth/Harrison	SB = 1,000' WB > 5,000'[2]	SB = 1,500' WB > 5,000'

Notes:
Queue length less than 500' rounded to the nearest 100', otherwise 500'.
1. Compared with existing conditions.
2. The model does not calculate the exact queue length when the queue exceeds 5,000 feet.

Source: Wilbur Smith Associates.

Essex Street On-Ramp to Eastbound I-80/Bay Bridge - While the queue length would not increase on the southbound approach, there would be more vehicles added to the queue in the eastbound direction. The queue eastbound on Harrison (extending down Second Street as well) would exceed 2,000 ft. under base cumulative-plus-project conditions, and would extend substantially further with the addition of UCSF/Mission Bay development in year 2015.

First and Harrison Streets On-Ramp to Eastbound I-80/Bay Bridge - The queues to this ramp would remain unchanged from the base cumulative-plus-project condition.

Fourth and Harrison Streets On-Ramp to Westbound I-80 - Queue length on the southbound approach would increase from 1,000 ft. to over 1,500 ft. as a result of traffic generated by UCSF/Mission Bay development.

Fifth and Bryant Streets On-Ramp to Eastbound I-80/Bay Bridge - Queue length in the northbound direction at the ramp would increase from 0 ft. to 200 ft. and would increase from 1,000 ft. with base cumulative-plus-project traffic to over 1,500 ft. in the eastbound approach with the addition of UCSF/Mission Bay traffic. On the southbound approach, UCSF/Mission Bay traffic would have minimal impacts and the queue would remain at approximately 2,500 ft.

Arterial Impacts

Existing-plus-Project

The impacts of the project on those study area arterial streets which are part of the Congestion Management Plan (CMP) network are summarized in Table IV.E.21 for weekday afternoon post-game (3:30 - 4:30 p.m.) and weekday evening pre-game (6:30 - 7:30 p.m.) times, and are discussed in more detail in the following paragraphs.

Travel speeds on the CMP network are monitored periodically to ensure conformance with acceptable level of service standards. Failure to maintain acceptable levels of service may result in a requirement under state law to prepare a Deficiency Plan to identify actions to improve levels of service to acceptable standards. CMP travel time performance measurements are focused on the p.m. peak traffic hour and not the time periods when the ballpark's impacts would be greatest.

TABLE IV.E.21 ●
SUMMARY OF PROJECT ARTERIAL LEVELS OF SERVICE

				Weekday Afternoon			Weekday Night		
				3:30-4:30 PM[1]			6:30-7:30 PM		
Name	From	To	Travel Direction	Existing [2]	Existing Plus Project	Cumulative Plus Project [3]	Existing [2]	Existing Plus Project	Cumulative Plus Project [3]
Third St.	Berry	Market	NB	C	F	F	C	C	C
Third St.	Mariposa	Berry	NB	B	F	F	B	B	F
Third St.	Berry	Mariposa	SB	B	C	F	B	B	F
Fourth St.	Market	Harrison	SB	F	F	F	E	F	F
Fourth St.	Harrison	Third St.	SB	C	C	C	C	F	F
Fifth St.	Brannan	Harrison	NB	F	F	C	D	D	C
Fifth St.	Harrison	Brannan	SB	F	F	D	D	F	D
Sixth St.	Brannan	Howard	NB	F	F	E	D	D	C
Sixth St.	Howard	Brannan	SB	D	D	C	C	F	F
Harrison	First St.	Fourth St.	WB	F	F	F	F	F	F
Harrison	Fourth St.	Seventh St.	WB	E	F	F	F	F	F
Harrison	First St.	Embarcadero	EB	D	F	F	C	C	E
Harrison	Embarcadero	First St.	WB	E	F	F	C	F	F
Bryant	Seventh St.	Fourth St.	EB	F	F	F	C	F	F
Bryant	Fourth St.	Embarcadero	EB	B	B	E	B	B	C
Embarcadero	2nd St.	Howard	NB	C	F	E	C	C	D
Embarcadero	Howard	Second St.	SB	C	C	E	C	C	D

Notes:
Levels of Service are based on April/May 1996 intersection traffic counts and the LOS methods described in Chapter 11 of the *Highway Capacity Manual*, 1994.

1. Existing Redistributed represents existing traffic counts redistributed to account for roadway improvements that are under construction.
2. Levels of Service under cumulative plus project conditions could be better than existing plus project conditions because signal timing along study arterials was optimized under cumulative conditions.

Source: Wilbur Smith Associates.

Third Street Corridor - Congested (LOS F) conditions would occur on Third Street (a designated route on the CMP network) from Berry Street to Market Street following weekday afternoon games, with the most noticeable congestion occurring between Berry and Folsom Streets. Third Street provides a relatively high-capacity, direct link between the project site and some potential off-street parking facilities, Market Street and downtown San Francisco. Third Street is also considered as a primary bus route for the assumed bus bridge (i.e., bus shuttle between the project and Market Street). Any traffic congestion along the Third Street corridor therefore would negatively impact travel time and ridership on the assumed MUNI bus bridge. The existing average travel speed of 15 mph (LOS C) on Third Street from China Basin to Market Street during the afternoon peak period would worsen to 7 mph (LOS F).

LOS F conditions would also occur on Third Street northbound from Mariposa Street to Berry Street, and across the Lefty O'Doul Bridge over China Basin Channel, after baseball games. The existing average travel speed on southbound Third Street from China Basin to Evans Street is 24 mph (LOS B). The section of Third Street is proposed by the Giants to serve multiple functions, including serving driveways to new project parking lots and as a connection for pedestrians from the parking areas to the ballpark. Due to the historic status of the Lefty O'Doul Bridge, widening to increase roadway and/or pedestrian capacity is unlikely and is therefore not assumed in this study.

Fourth Street Corridor - Congested (LOS F) conditions would occur southbound on Fourth Street from Market Street to Harrison Street and across the Peter Maloney Bridge over China Basin Channel to the proposed Giants parking facilities near Third Street before baseball games. Fourth Street serves as a primary access route between Market Street, downtown San Francisco, some potential project parking facilities and the dedicated parking lots near Third and Fourth Streets intersection. The existing average travel speed on southbound Fourth Street from Harrison to Third Streets is 15 mph (LOS C) throughout the afternoon peak travel period. Deterioration in travel speeds on Fourth Street would impact MUNI bus service, including several bus lines that would serve the ballpark. As a designated "transit

important" street, maintenance of acceptable travel times and levels of service on Fourth Street are critical to maintaining MUNI schedules and bus ridership.

Fifth Street Corridor - After a weekday afternoon game (3:30 - 4:30 p.m.) congested (LOS F) conditions would occur on Fifth Street in both directions between Brannan and Harrison Streets, particularly near the I-80 eastbound on-ramp. When weekday night games are played, congested conditions from the p.m. peak commute would extend onto the 6:30 - 7:30 period in the southbound direction. Fifth Street would be a major access route to the ballpark from I-80. Congestion at the Fifth Street/I-80 interchange may be severe enough to create a level of service exceedence for the Fifth Street corridor, as measured between Brannan and Market Streets. Existing average travel speeds on Fifth Street are 11 mph southbound (LOS D) and 12 mph northbound (LOS C).

Sixth Street Corridor - Congested (LOS F) conditions would continue to occur northbound on Sixth Street between Howard and Brannan Streets after a weekday afternoon game (3:30 - 4:30 p.m.). This street segment is normally congested during this time period, and this condition would be worsened somewhat by the small amount of ballpark traffic on the cross streets and on Sixth Street. Project traffic would also cause LOS to deteriorate from LOS C to LOS F in the southbound direction during the hour before weekday night baseball games. Existing average travel speeds on Sixth Street between Market and Brannan Streets is 15 mph (LOS C) southbound and 12 mph northbound (LOS D).

Harrison Street Corridor - During the hour after weekday afternoon games (3:30 - 4:30 p.m.), congested (LOS F) conditions would occur westbound between First and Seventh Streets due to ballpark traffic. This condition would be caused in part by already congested intersections near I-80 freeway ramps on Harrison Street. Ballpark traffic from I-80 would use westbound Harrison to access Second and Fourth Streets in approaching the ballpark area. During this same time, after weekday afternoon games, Harrison Street between First Street and The Embarcadero would deteriorate from LOS D or E to LOS F in both directions. Existing delays during the 6:30 to 7:30 p.m. period would increase.

Existing average travel speeds on westbound Harrison Street are 15 mph (LOS C) from The Embarcadero to First Street, and LOS F from First to Fourth Streets and from Fourth to Eighth Streets. Existing travel speed measurements were last recorded in 1992 - 93.

Bryant Street Corridor - Before weekday night baseball games (6:30 - 7:30 p.m.), congested (LOS F) conditions would occur on eastbound Bryant Street from Seventh Street to Fourth Street. After weekday afternoon (3:30 - 4:30 p.m.) baseball games, congested conditions already occur on Bryant Street from Seventh Street to Fourth Street; ballpark traffic would not substantially worsen these conditions. Ballpark traffic would not cause new LOS E or F conditions on eastbound Bryant Street from Fourth Street to The Embarcadero at any of the study time periods. Existing average travel speeds eastbound on Bryant Street are 13 mph (LOS C) from Division to Fourth Streets, increasing to 22 mph (LOS B) from Fourth Street to The Embarcadero.

The Embarcadero Corridor - After weekday afternoon (3:30 - 4:30 p.m.) games congested (LOS F) conditions would occur on northbound Embarcadero between Second and Howard Streets. Existing average travel speeds on The Embarcadero (last measured in 1992 - 93) are 15 mph (LOS C) northbound and in the southbound direction.

Weekday Late Night/Weekend Conditions

Based on field observations, all of the study arterial streets operate at uncongested levels of service during the post-weekday night game period (10:30 - 11:30 p.m.) and the post-weekend game time period (Saturday 4:00 - 5:00 p.m.). The Transportation Background Report provides more detail regarding these conditions. Project traffic would have minimal impacts on these arterial streets and would not cause any of the study corridors to operate at unacceptable levels of service.

Cumulative-plus-Project

The impact of cumulative-plus-project traffic on the study arterial streets is summarized in Table IV.E.21, p. IV.136. Under cumulative-plus-project conditions, traffic would increase on all study arterials compared to existing-plus-project traffic. It is important to note that the level of service of some arterials improved from existing-plus-project to cumulative-plus-project conditions. This is because under cumulative-plus-project conditions, the signal timing at intersections along the arterial was optimized to account for the increase in traffic in specific movements. This is routinely done by the Department of Parking and Traffic when conditions warrant.

During the hour following weekday afternoon games (3:30 - 4:30 p.m.), both directions of Third Street from Berry Street to Mariposa Street would degrade from LOS C to LOS F compared to existing-plus-project traffic conditions. During the same time period, the eastbound direction of Bryant Street between Fourth Street and The Embarcadero would deteriorate from LOS B to LOS E. The southbound direction of The Embarcadero between Howard and Second Streets would degrade from LOS C to LOS E after a weekday afternoon game (3:30 - 4:30 p.m.). The Fifth Street corridor would improve to LOS D or better as a result of signal timing changes.

During the weekday evening pre-game time period (6:30 - 7:30 p.m.), cumulative-plus-project traffic would cause significant impacts on three arterials. The section of Third Street between Berry and Mariposa Streets (both directions) would deteriorate from LOS B to LOS F with cumulative-plus-project traffic. The eastbound direction of Harrison Street from First Street to The Embarcadero would decline from LOS C to LOS E during this time period. Fifth Street southbound could improve to LOS D or better.

Non-Game Day Scenario

During the weekday p.m. peak hour on a non-game day (4:30 - 5:30 p.m.), existing traffic plus traffic from project employees and visitors would cause deterioration from LOS D to F on The Embarcadero northbound. With cumulative development, four study arterials would decline to LOS F (see Table IV.E.22) from LOS D or better under existing-plus-project conditions. The section of Harrison Street (eastbound) between First Street and The Embarcadero would decline from LOS D to LOS F. The eastbound direction of Bryant Street from Seventh to Fourth Street would also degrade from LOS D to LOS F. The Embarcadero from Howard to Second Street (southbound) would deteriorate from LOS C to LOS F. The northbound section of Third Street between Maripsoa and Berry Streets would decline from LOS C to LOS F.

UCSF/Mission Bay 2015 Cumulative Scenario

Additional traffic generated by UCSF/Mission Bay developments would increase delay at study arterials. The arterial levels of service under UCSF/Mission Bay cumulative-plus-project conditions are shown in Table IV.E.23.

Fifth Street Corridor - As a result of additional traffic generated by UCSF/Mission Bay development, the level of service in the southbound direction between Harrison and Brannan Streets would deteriorate from LOS D to LOS E during the hour before weekday night games (6:30 - 7:30 p.m.), compared with base cumulative conditions.

Bryant Street Corridor - During the hour after weekday afternoon games (3:30 - 4:30 p.m.), the level of service on eastbound Bryant Street between Fourth Street and The Embarcadero would deteriorate from LOS E under base cumulative-plus-project conditions to LOS F with the addition of UCSF/Mission Bay traffic.

TABLE IV.E.22
WEEKDAY NON-GAME DAY
SUMMARY OF ARTERIAL LEVELS OF SERVICE

				Weekday Night		
				4:30-5:30 pm		
Name	From	To	Travel Direction	Existing[1]	Existing Plus Project	Cumulative Plus Project[2]
Third St.	Berry	Market	NB	F	F	F
Third St.	Mariposa	Berry	NB	B	C	F
Third St.	Berry	Mariposa	SB	B	B	C
Fourth St.	Market	Harrison	SB	F	F	F
Fourth St.	Harrison	Third St.	SB	C	C	C
Fifth St.	Brannan	Harrison	NB	F	F	C
Fifth St.	Harrison	Brannan	SB	F	F	D
Sixth St.	Brannan	Howard	NB	F	F	F
Sixth St.	Howard	Brannan	SB	F	F	D
Harrison	First St.	Fourth St.	WB	F	F	F
Harrison	Fourth St.	Seventh St.	WB	F	F	F
Harrison	First St.	Embarcadero	EB	D	D	F
Harrison	Embarcadero	First St.	WB	F	F	F
Bryant	Seventh St.	Fourth St.	EB	D	D	F
Bryant	Fourth St.	Embarcadero	EB	C	C	C
Embarcadero	Second St.	Howard	NB	D	F	F
Embarcadero	Howard	Second St.	SB	C	C	F

Note:
Levels of Service are based on April/May 1996 intersection traffic counts and the LOS methods described in Chapter 11 of the *Highway Capacity Manual*, 1994.

1. Existing Redistributed represents existing traffic counts redistributed to account for roadway improvements that are under construction.
2. Levels of Service under cumulative-plus-project conditions could be better than existing-plus-project conditions because signal timing along study arterials was optimized under cumulative conditions.

Source: Wilbur Smith Associates.

TABLE IV.E.23 ●
UCSF/MISSION BAY CUMULATIVE+PROJECT ARTERIAL CONDITIONS

Name	From	To	Travel Direction	Weekday Afternoon 3:30-4:30 PM[1] Base Cumulative Plus Project	Weekday Afternoon 3:30-4:30 PM[1] UCSF Cumulative Plus Project	Weekday Night 6:30-7:30 PM Base Cumulative Plus Project	Weekday Night 6:30-7:30 PM UCSF Cumulative Plus Project
Third Street	Berry	Market	NB	F	F	C	C
Third Street	Mariposa	Berry	NB	F	F	F	F
Third Street	Berry	Mariposa	SB	F	F	F	F
Fourth Street	Market	Harrison	SB	F	F	F	F
Fourth Street	Harrison	Third Street	SB	C	C	F	F
Fifth Street	Brannan	Harrison	NB	C	C	C	C
Fifth Street	Harrison	Brannan	SB	D	D	D	E
Sixth Street	Brannan	Howard	NB	E	E	C	C
Sixth Street	Howard	Brannan	SB	C	C	F	F
Harrison	First Street	Fourth Street	WB	F	F	F	F
Harrison	Fourth Street	Seventh Street	WB	F	F	F	F
Harrison	First Street	Embarcadero	EB	F	F	E	E
Harrison	Embarcadero	First Street	WB	F	F	F	F
Bryant	Seventh Street	Fourth Street	EB	F	F	F	F
Bryant	Fourth Street	Embarcadero	EB	E	F	C	C
Embarcadero	2nd Street	Howard	NB	E	F	D	D
Embarcadero	Howard	Second Street	SB	E	E	D	D

Notes:
Levels of Service are based on April/May 1996 intersection traffic counts and the LOS methods described in Chapter 11 of the *Highway Capacity Manual*, 1994.

Source: Wilbur Smith Associates.

The Embarcadero Corridor - During the hour after weekday afternoon games (3:30 - 4:30 p.m.), the northbound direction between Second Street and Howard Street would deteriorate from LOS E under base cumulative-plus-project traffic to LOS F under UCSF/Mission Bay cumulative-plus-project conditions.

UCSF/Mission Bay Cumulative Non-Game Day Scenario

During the weekday p.m. peak hour on a non-game day (4:30 - 5:30 p.m.), traffic generated by UCSF/Mission Bay development would increase traffic volumes on all study arterials. Levels of service for these arterials are shown in Table IV.E.24. With UCSF/Mission Bay cumulative-plus-project traffic, the level of service in the southbound direction of Third Street between Mariposa and Berry Streets would deteriorate from LOS C under base cumulative-plus-project conditions to LOS F.

Intersections

Impacts at the 66 study intersections are presented in terms of levels of service for each study time period in Table IV.E.25. Project auto trips were assigned to the study roadway network based on their origins/destinations and the most likely routes that motorists would take. Detailed information on vehicle trip distribution is shown in Appendix C, Figures X.C.5 and X.C.6, pp. A.124 - A.125. Intersections where the existing level of service would change to LOS E and LOS F with the addition of project traffic are listed in the text later in this section. Intersections near the project site and near the proposed dedicated parking areas south of the China Basin Channel would have high volumes of traffic and pedestrian activity. Persons interested in traveling to residences, restaurants and other retail/entertainment locations or the marina in the South Beach area could be delayed by ballpark-related traffic during the hour before and after ballgames. Specific game-oriented traffic detour and mitigation plans for these intersections are presented in this report in V.B. Transportation and Circulation and in Chapter 5 of the Background Transportation Report.

TABLE IV.E.24
WEEKDAY NON-GAME DAY
UCSF/MISSION BAY CUMULATIVE + PROJECT CONDITIONS
SUMMARY OF ARTERIAL LEVELS OF SERVICE

				Weekday Night	
				4:30-5:30 pm	
Name	From	To	Travel Direction	Base Cumulative Plus Project	UCSF Cumulative Plus Project
Third St.	Berry	Market	NB	F	F
Third St.	Mariposa	Berry	NB	F	F
Third St.	Berry	Mariposa	SB	C	F
Fourth St.	Market	Harrison	SB	F	F
Fourth St.	Harrison	Third St.	SB	C	C
Fifth St.	Brannan	Harrison	NB	C	C
Fifth St.	Harrison	Brannan	SB	D	D
Sixth St.	Brannan	Howard	NB	F	F
Sixth St.	Howard	Brannan	SB	D	D
Harrison	First St.	Fourth St.	WB	F	F
Harrison	Fourth St.	Seventh St.	WB	F	F
Harrison	First St.	Embarcadero	EB	F	F
Harrison	Embarcadero	First St.	WB	F	F
Bryant	Seventh St.	Fourth St.	EB	F	F
Bryant	Fourth St.	Embarcadero	EB	C	C
Embarcadero	2nd St.	Howard	NB	F	F
Embarcadero	Howard	Second St.	SB	F	F

Note:
Levels of Service are based on April/May 1996 intersection traffic counts and the LOS methods described in Chapter 11 of the *Highway Capacity Manual*, 1994.

Source: Wilbur Smith Associates.

TABLE IV.E.25 •
SUMMARY OF PROJECT INTERSECTION LEVELS OF SERVICE, GAME DAYS

Study Intersections	Existing Redistributed[1]				Existing Redistributed + Project				Cumulative with Project			
	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Berry Street at:												
▸ Third Street	A	A	N/A	N/A	D	A	N/A	N/A	F	A	N/A	N/A
King Street at:												
▸ Fourth Street	B	B	B	B	C	F	B	C	B	F	B	B
▸ Third Street	C	B	B	B	F	B	B	F	F	B	B	E
▸ Second Street	D	C	B	B	F	C	C	C	C	B	B	B
Townsend Street at:												
▸ Eighth/Henry Adams/Division	A	A	A	A	A	A	A	A	C	B	B	C
▸ Fourth Street	B	B	B	B	B	F	B	B	B	F	B	B
▸ Third Street	B	D	B	B	F	D	F	F	F	B	A	E
▸ Second Street	B	B	B	B	B	B	B	B	B	B	B	B
▸ The Embarcadero	B	B	B	B	B	B	B	B	C	B	B	C
Brannan Street at:												
▸ Sixth Street/I-280 Ramps	C	B	B	B	C	B	B	B	B	B	B	B
▸ Fifth Street	B	B	B	B	C	B	B	B	C	B	B	B
▸ Fourth Street	B	B	B	B	B	F	B	B	B	D	B	B
▸ Third Street	B	B	B	B	F	B	D	F	F	B	B	F
▸ Second Street	B	B	B	B	B	B	B	B	B	B	B	B
▸ The Embarcadero	C	B	B	B	D	B	B	B	B	A	A	B
Bryant Street at:												
▸ Seventh Street	B	B	N/A	N/A	B	B	N/A	N/A	B	B	N/A	N/A
▸ Sixth Street	C	B	B	B	D	F	B	B	F	F	B	B

Notes:
N/A = Intersection not analyzed during this time period
1. Existing Redistributed represents existing traffic counts redistributed to account for roadway improvements that are under construction.

TABLE IV.E.25 •
SUMMARY OF PROJECT INTERSECTION LEVELS OF SERVICE, GAME DAYS

Study Intersections	Existing Redistributed[1]				Existing Redistributed + Project				Cumulative with Project			
	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Bryant Street at: (cont.)												
▸ Fifth Street	F	C	B	C	F	F	B	D	F	F	B	B
▸ Fourth Street	B	B	B	B	B	F	B	B	B	F	B	E
▸ Third Street	B	B	B	B	F	B	F	F	F	B	F	F
▸ Second Street	E	B	B	B	F	D	B	B	F	B	B	B
▸ Main Street	B	B	N/A	N/A	C	B	N/A	N/A	D	C	N/A	N/A
▸ The Embarcadero	C	B	B	B	D	B	C	C	C	B	C	B
Harrison Street at:												
▸ Seventh Street	B	B	B	B	B	B	B	B	B	B	B	B
▸ Sixth Street	D	B	B	B	E	B	B	B	C	B	B	B
▸ Fifth Street	C	B	B	B	C	E	B	B	C	D	B	B
▸ Fourth Street	F	F	B	B	F	F	F	F	F	F	B	C
▸ Third Street	B	B	B	B	F	D	B	F	F	C	C	F
▸ Second Street	F	E	N/A	N/A	F	F	N/A	N/A	F	F	N/A	N/A
▸ Essex Street at I-80 on-ramp	F	F	B	B	F	F	B	B	F	B	A	B
▸ First Street	F	F	B	B	F	F	B	B	F	F	B	C
▸ Fremont Street	E	B	N/A	N/A	F	F	N/A	N/A	F	F	N/A	N/A
▸ Main Street	D	B	B	B	F	B	C	B	F	E	B	B
▸ The Embarcadero	B	B	B	B	F	B	B	C	F	D	B	F
Folsom Street at:												
▸ Sixth Street	D	B	N/A	N/A	E	F	N/A	N/A	F	F	N/A	N/A
▸ Fourth Street	F	E	N/A	N/A	F	F	N/A	N/A	E	F	N/A	N/A

Notes:
N/A = Intersection not analyzed during this time period
1. Existing Redistributed represents existing traffic counts redistributed to account for roadway improvements that are under construction.

TABLE IV.E.25 •
SUMMARY OF PROJECT INTERSECTION LEVELS OF SERVICE, GAME DAYS

Study Intersections	Existing Redistributed[1]				Existing Redistributed + Project				Cumulative with Project			
	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Folsom Street at: (cont.)												
▸ Third Street	B	B	N/A	N/A	E	B	N/A	N/A	C	B	N/A	N/A
▸ Second Street	F	D	N/A	N/A	F	F	N/A	N/A	F	D	N/A	N/A
▸ First Street	D	F	N/A	N/A	D	F	N/A	N/A	D	B	N/A	N/A
▸ Fremont Street	B	B	N/A	N/A	B	B	N/A	N/A	B	A	N/A	N/A
▸ Main Street	B	B	N/A	N/A	B	B	N/A	N/A	B	B	N/A	N/A
▸ The Embarcadero	B	B	B	B	B	B	B	B	F	F	B	F
Howard Street at:												
▸ Sixth Street	F	C	N/A	N/A	F	C	N/A	N/A	F	C	N/A	N/A
▸ Fourth Street	C	C	N/A	N/A	F	E	N/A	N/A	C	C	N/A	N/A
▸ Third Street	B	B	N/A	N/A	D	B	N/A	N/A	B	B	N/A	N/A
Sixteenth Street at:												
▸ Potrero Avenue	C	B	B	B	C	B	B	B	F	C	B	C
▸ Vermont Street	B	A	N/A	N/A	B	A	N/A	N/A	D	B	N/A	N/A
▸ Rhode Island Street	B	B	N/A	N/A	B	B	N/A	N/A	D	C	N/A	N/A
▸ Mississippi/7th/Pennsylvania	B	A	N/A	N/A	C	A	N/A	N/A	D	B	N/A	N/A
▸ Third Street	B	B	B	B	F	B	C	E	F	F	B	F
▸ Illinois Street	A	A	N/A	N/A	F	B	N/A	N/A	F	B	N/A	N/A
Mariposa Street at:												
▸ Vermont Street	B	B	N/A	N/A	B	B	N/A	N/A	B	B	N/A	N/A
▸ De Haro Street	A	A	N/A	N/A	A	A	N/A	N/A	A	A	N/A	N/A
▸ Pennsylvania/I-280 on-ramp	C	B	A	A	C	B	A	A	C	B	N/A	N/A

Notes:
N/A = Intersection not analyzed during this time period
1. Existing Redistributed represents existing traffic counts redistributed to account for roadway improvements that are under construction.

TABLE IV.E.25 •
SUMMARY OF PROJECT INTERSECTION LEVELS OF SERVICE, GAME DAYS

Study Intersections	Existing Redistributed[1]				Existing Redistributed + Project				Cumulative with Project			
	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Mariposa Street at: (cont.)												
▸ I-280 off-ramp	B	B	A	B	B	B	B	B	B	B	A	A
▸ Third Street	B	B	B	B	F	F	F	F	F	D	F	F
▸ Illinois Street	A	A	A	A	C	F	B	B	C	F	B	B
Potrero Avenue at:												
▸ Tenth/Brannan/Division	B	B	B	C	B	B	B	C	B	B	B	C
Third/Fourth Streets	B	B	B	B	F	F	F	F	F	F	F	F
Market Street at:												
▸ Fourth/Stockton/Ellis	B	B	B	B	B	B	B	B	B	B	B	B
▸ Third/Kearny/Geary	B	B	B	B	B	B	B	B	B	B	B	B
Third/Cesar Chavez (Army) Sts.	D	B	B	B	D	B	B	B	F	B	B	C
Third/Jamestown Streets	A	B	B	B	A	B	B	B	A	A	A	A
Mission Street at:												
▸ 4th Street	B	B	N/A	N/A	B	B	N/A	N/A	B	B	N/A	N/A
▸ 3rd Street	B	B	N/A	N/A	B	B	N/A	N/A	B	B	N/A	N/A
Embarcadero/Broadway	D	C	B	C	E	F	C	D	D	E	B	C

Notes:
N/A = Intersection not analyzed during this time period
1. Existing Redistributed represents existing traffic counts redistributed to account for roadway improvements that are under construction.

Source: Wilbur Smith Associates.

Prior to adding ballpark-related traffic to local intersections, existing traffic was redistributed to account for the effects of previously discussed roadway improvements that are now under construction.

Existing-plus-Project

Weekday Afternoon (3:30 - 4:30 p.m.) Post-Day Game Conditions

The greatest impact from project-related traffic would occur after some or all of the weekday afternoon games. During the time period from 3:30 to 4:30 p.m., 10 of the 66 study intersections currently operate at LOS E or LOS F; (2 at LOS E; 8 at LOS F). The level of service at 19 more of the 66 intersections would deteriorate to a level of service E or F with the project, for a total of 27 intersections at LOS E or F. (See Table IV.E.25 and Figure IV.E.2. Note that the existing traffic has been redistributed to account for ongoing roadway construction that would be complete by the year 2000.) The 19 intersections worsening to LOS E or F with the project include:

Intersection	Level of Service Change
King Street at Third Street	C to F
King Street at Second Street	D to F
Townsend Street at Third Street	B to F
Brannan Street at Third Street	B to F
Bryant Street at Third Street	B to F
Bryant Street at Second Street	E to F
Harrison Street at Sixth Street	D to E
Harrison Street at Third Street	B to F
Harrison Street at Fremont Street	E to F
Harrison Street at Main Street	D to F
Harrison Street at The Embarcadero	B to F
Folsom Street at Sixth Street	D to E
Folsom Street at Third Street	B to E
Howard Street at Fourth Street	C to F
Sixteenth Street at Third Street	B to F
Sixteenth Street at Illinois Street	A to F

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure IV.E.2 Existing + Project LOS
Weekday Afternoon Post-Game Scenario (3:30 - 4:30 p.m.)

■ Mariposa Street at Third Street	B to F
■ Third Street at Fourth Street	B to F
■ The Embarcadero at Broadway	D to E

The impacted intersections are focused along Third Street due to the heavy flows of traffic that would be departing the ballpark in both the north and south direction. Also, intersections near the I-80 ramps on Harrison and Bryant Streets would be impacted during this time period.

Weekday Evening (6:30-7:30 p.m.) Pre-Night Game Conditions

During the 6:30 to 7:30 p.m. period, 6 of the 66 study intersections currently operate at LOS E or F (2 at LOS E and 4 at LOS F). Before a weekday night game in the 6:30 to 7:30 p.m. period, project traffic would cause 17 additional intersections to decline to LOS E or LOS F (see Table IV.E.25, pp. IV.146 - IV.149, and Figure IV.E.3). A total of 21 intersections would be at LOS E or F, as 2 intersections declined from LOS E to F.

Intersection	Level of Service Change
■ King Street at Fourth Street	B to F
■ Townsend Street at Fourth Street	B to F
■ Brannan Street at Fourth Street	B to F
■ Bryant Street at Sixth Street	B to F
■ Bryant Street at Fifth Street	C to F
■ Bryant Street at Fourth Street	B to F
■ Harrison Street at Fifth Street	B to E
■ Harrison Street at Fremont Street	B to F
■ Harrison at Second Street	E to F
■ Folsom Street at Sixth Street	B to F
■ Folsom Street at Fourth Street	E to F
■ Folsom Street at Second Street	D to F
■ Howard Street at Fourth Street	C to E
■ Mariposa Street at Third Street	B to F
■ Mariposa Street at Illinois Street	A to F
■ Third Street at Fourth Street	B to F
■ The Embarcadero at Broadway	C to F

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

● Figure IV.E.3 Existing + Project LOS
Weekday Night Pre-Game Scenario (6:30 - 7:30 p.m.)

During this pre-night game time period, the impacted intersections are clustered along Fourth Street, a major ballpark access route. Intersections near the I-80 ramps on Harrison and Bryant Street also would be impacted.

Weekday Night (10:30-11:30 p.m.) Post-Night Game Conditions

All 38 of the study intersections analyzed during the 10:30 to 11:30 p.m. weekday time period currently operate at LOS B or better. After a weekday night game during the 10:30 to 11:30 p.m. period five intersections would experience a decline in service level to LOS E or LOS F. (See Table IV.E.25, p. IV.146, and Figure IV.E.4.) The duration of congestion after weekday night game, however, would be shorter than during weekday afternoon time periods because of less background traffic. The five impacted intersections are:

Intersection	Level of Service Change
■ Townsend Street at Third Street	B to F
■ Bryant Street at Third Street	B to F
■ Harrison Street at Fourth Street	B to F
■ Mariposa Street at Third Street	B to F
■ Third Street at Fourth Street	B to F

After weekday night games, the primary intersection impacts occur on Third Street due to the flow of vehicles out of the dedicated ballpark parking area to both the north and south.

Weekend Afternoon (Saturday 4:00 - 5:00 p.m.) Post-Game Conditions

All 38 of the study intersection analyzed during the Saturday afternoon 4:00 to 5:00 p.m. time period currently operate at LOS C or better. After a weekend afternoon game (4:00 - 5:00 p.m.), project traffic would cause nine intersections to decline to a level of service LOS

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure IV.E.4 Existing + Project LOS
Weekday Night Post-Game Scenario (10:30 - 11:30 p.m.)

E or LOS F condition (see Table IV.E.25 and Figure IV.E.5). The nine impacted intersections are:

Intersection	Level of Service Change
■ King Street at Third Street	B to F
■ Townsend Street at Third Street	B to F
■ Brannan Street at Third Street	B to F
■ Bryant Street at Third Street	B to F
■ Harrison Street at Fourth Street	B to F
■ Harrison Street at Third Street	B to F
■ Sixteenth Street at Third Street	B to E
■ Mariposa Street at Third Street	B to F
■ Third Street at Fourth Street	B to F

After a weekend afternoon game the primary impacts would be along Third Street north and south of the ballpark due to traffic exiting ballpark parking in combination with the existing traffic in the South of Market area.

Impacts of Bascule Bridge Operations

As discussed in III.E. Transportation and Circulation, p. III.92, the bascule lift bridges across China Basin Channel at Third and Fourth Streets now open for waterborne traffic in the Channel. A typical bridge lift to allow a boat or ship to pass both bridges involves three- to five-minute delays to traffic and pedestrians at each bridge. During the spring and summer there have been an average of approximately four bridge openings per day. Under Federal Drawbridge Operating Regulation, 33 CFR 117.149 China Basin, Mission Creek, which requires the bridges to "open on signal if at least one hour advance notice is given," there is the potential that a bridge opening could be requested for the period during the hour before or after a baseball game or other event. Most requests for openings could likely be shifted to avoid the heaviest traffic periods, but at present there is no way to assure that the bridge would not be opened during any given one-hour time period. Delays in lifting the bridge, at least similar to current delays (up to one-half hour), would be expected if alternative arrangements were not made. The City and the Coast Guard are actively pursuing meetings with boaters' associations, neighborhood associations and the developers to resolve

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure IV.E.5 Existing + Project LOS
Saturday Post-Game Scenario (4:00 - 5:00 p.m.)

the issue of delays through such actions as cooperative agreements, amended guidelines for bridge tenders, and increased staffing at the bridges during peak periods.

During the hour before and after games, both bridges would experience heavy traffic and pedestrian use. For example, the heaviest traffic flow would occur on the Lefty O'Doul (Third Street) Bridge northbound just after a weekday afternoon game (3:30 - 4:30 p.m.). During this period it is estimated that there would be an hourly flow of 3,750 vehicles in the two northbound lanes. An opening of the bridge for a five-minute period could cause a queue of vehicles south of the bridge of about 150 cars (3,000 ft.) in each lane to approximately Sixteenth Street. Because of the heavy flow of northbound traffic on Third Street, traffic would be queued south of the Third Street and King Street intersection, which would be at level of service F. This queue could extend across the bridge. When the bridge opening warning sounds and the gates at the south end of the bridge close, the bridge tenders would have to wait for the remaining traffic on the bridge to clear. This could add one to two minutes to the time of the bridge closure. The queuing discussed above would then build south of the bridge until the bridge reopened and would then shift back to the Third and King Streets intersection approach. The net effect would be a lengthening of the total time required to dissipate traffic in the area near the ballpark after a game. A five-minute bridge closure could add 10 to 15 minutes to the time required for traffic levels to return to normal, non-game day, conditions. For the period after a weekday afternoon game, however, the impact could be more severe as the period of delay and queuing could extend into the peak commute traffic period.

Cumulative-plus-Project

Cumulative-plus-project impacts for the year 2015 at all study area intersections are shown for each study time period in Table IV.E.25. The cumulative intersection levels of service were calculated assuming the roadway improvements described on pp. IV.79 - IV.87 will be implemented and signal timing will be optimized at all study intersections due to cumulative growth in every-day traffic. Therefore, some intersections would improve compared to the existing-plus-project conditions. In addition, the MUNI Bayshore light rail extension was assumed to be in place operating in exclusive lanes one-way southbound on Fourth Street and

one-way northbound on Third Street south of King Street. South of the Third Street/Fourth Street intersection the light rail was assumed to continue on Third in a two-way configuration. Intersection levels of service under cumulative-plus-project conditions are compared with those under existing-plus-project conditions. As noted previously, intersections near the project site and near the proposed dedicated parking area at the Third and Fourth Streets intersection would have high volumes of traffic and pedestrian activity. Specific game-oriented traffic detour and improvement plans for these intersections are presented in Chapter 5 of the Background Transportation Report.

Cumulative Weekday Afternoon (3:30 - 4:30 p.m.) Post-Day Game

The greatest impact from the project-related traffic under cumulative conditions would occur after a weekday afternoon game. During the time period from 3:30 - 4:30 p.m., the level of service at 5 intersections would improve compared with the existing-plus-project traffic conditions (due to signal timing changes, explained above) from LOS E or F to LOS D or better. Six intersections would deteriorate to LOS F (see Table IV.E.25, p. IV.146). These additional intersections would include the following:

Intersection	Level of Service Change
■ Berry Street at Third Street	D to F
■ Bryant Street at Sixth Street	D to F
■ Folsom Street at Sixth Street	E to F
■ Sixteenth Street at Potrero Avenue	C to F
■ Folsom Street at The Embarcadero	B to F
■ Third Street at Cesar Chavez Street	D to F

Accounting for intersections that would improve and those that would remain at LOS E or F, adding these 6 additional intersections results in a total of 27 intersections at LOS E or F following a weekday afternoon game.

Cumulative Weekday Evening (6:30 - 7:30 p.m.) Pre-Night Game

During the evening pre-game period of 6:30 - 7:30 p.m., the ballpark plus cumulative traffic would cause three more intersections to decline to LOS E or F compared to existing-plus-project conditions. Seven intersections would improve to LOS D or better. A total of 17 intersections would operate below LOS D. The three additional intersections are:

Intersection	Level of Service Change
■ Folsom Street at The Embarcadero	B to F
■ Harrison Street at Main Street	B to E
■ Sixteenth Street at Third Street	B to F

Cumulative Weekday Night (10:30 - 11:30 p.m.) Post-Night Game

After a weekday night game during the 10:30 - 11:30 p.m. period no more of the study intersections would experience a decline in service level to LOS E or F, and two would improve to LOS D or better, compared with existing-plus-project conditions when five study intersections would operate below LOS D.

Cumulative Weekend Afternoon (Saturday 4:00 - 5:00 p.m.) Post-Game

After a weekend afternoon game, ballpark plus cumulative traffic would cause four intersections to decline to LOS E or F condition. One intersection would improve from LOS F to C (Harrison at Fourth Street), and two would improve from LOS F to E. A total of 11 study intersections would operate below LOS D, compared to intersections under the existing-plus-project scenario. The four additional intersections are:

Intersection	Level of Service Change
■ Bryant Street at Fourth Street	B to E
■ Folsom Street at The Embarcadero	B to F
■ Harrison Street at The Embarcadero	C to F
■ Sixteenth Street at Third Street	E to F

Impact of MUNI Metro Light Rail Extension

The proposed MUNI Metro Light Rail Extension (Bayshore Line) was assumed to travel north on Third Street and southbound on Fourth Street between King Street and the Third/Fourth Street intersection south of the Channel. It would potentially reduce the capacity at intersections along Third Street and along Fourth Street south of King, and would worsen the level of service at those intersections under cumulative conditions. It was assumed that the light rail would operate in an exclusive lane in each direction, requiring that one traffic lane be removed on both Third and Fourth Streets south of King Street and two lanes be removed from Third Street south of Fourth Street.

The operational configuration proposed for the light rail across the Peter Maloney Bridge would not involve an exclusive lane for the light rail. Light rail would share one of the three lanes on the bridge with traffic. A special signal system is under consideration on the bridge approaches that would stop traffic when a light rail vehicle approaches the bridge and holds traffic until the light rail vehicle clears the bridge. This would reduce the capacity of the bridge somewhat, but the reduction would not be as great as the removal of a traffic lane north and south of the bridge and through the adjacent intersections.

Non-Game Day Scenario

Non-game day intersection levels of service for the p.m. peak hour (4:30 to 5:30) are shown in Table IV.E.26, and illustrated in Figure IV.E.6. During this period, 4 of the 66 study

TABLE IV.E.26
SUMMARY OF NON-GAME DAY INTERSECTION LEVELS OF SERVICE

Study Intersections	Level of Service		
	Existing[1] Weekday 4:30-5:30 p.m.	Existing[1] Plus Project Weekday 4:30-5:30 p.m.	Cumulative Plus Project[2] Weekday 4:30-5:30 p.m.
Berry Street at:			
▸ Third Street	A	A	A
King Street at:			
▸ Fourth Street	B	B	B
▸ Third Street	B	C	B
▸ Second Street	F	F	B
Townsend Street at:			
▸ Eighth/Henry Adams/Division	B	B	C
▸ Fourth Street	B	B	C
▸ Third Street	E	E	F
▸ Second Street	B	B	B
▸ The Embarcadero	C	C	D
Brannan Street at:			
▸ Sixth Street/I-280 Ramps	F	F	E
▸ Fifth Street	B	B	C
▸ Fourth Street	C	C	C
▸ Third Street	C	C	F
▸ Second Street	D	D	D
▸ The Embarcadero	B	B	A
Bryant Street at:			
▸ Seventh Street	B	B	B
▸ Sixth Street	D	D	C
▸ Fifth Street	F	F	F
▸ Fourth Street	B	B	B
▸ Third Street	B	B	B
▸ Second Street	F	F	F
▸ Main Street	D	D	E
▸ The Embarcadero	F	F	C
Harrison Street at:			
▸ Seventh Street	B	B	B
▸ Sixth Street	D	D	C
▸ Fifth Street	C	C	C

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TABLE IV.E.26
SUMMARY OF NON-GAME DAY INTERSECTION LEVELS OF SERVICE

Study Intersections	Level of Service		
	Existing[1] Weekday 4:30-5:30 p.m.	Existing[1] Plus Project Weekday 4:30-5:30 p.m.	Cumulative Plus Project[2] Weekday 4:30-5:30 p.m.
Harrison Street at: (cont.)			
► Fourth Street	F	F	F
► Third Street	C	C	D
► Second Street	F	F	F
► Essex Street at I-80 on-ramp	F	F	F
► First Street	F	F	F
► Fremont Street	F	F	F
► Main Street	D	D	F
► The Embarcadero	D	F	F
Folsom Street at:			
► Sixth Street	E	E	F
► Fourth Street	F	F	D
► Third Street	C	C	B
► Second Street	E	E	F
► First Street	F	F	D
► Fremont Street	B	B	A
► Main Street	C	C	B
► The Embarcadero	E	E	F
Howard Street at:			
► Sixth Street	F	F	F
► Fourth Street	C	C	B
► Third Street	F	F	C
Sixteenth Street at:			
► Potrero Avenue	C	C	F
► Vermont Street	F	F	F
► Rhode Island Street	C	C	D
► Mississippi/7th/Pennsylvania	C	C	D
► Third Street	B	B	F
► Illinois Street	A	A	A
Mariposa Street at:			
► Vermont Street	B	B	B
► DeHaro Street	A	A	A
► Pennsylvania/I-280 on-ramp	C	C	C

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TABLE IV.E.26
SUMMARY OF NON-GAME DAY INTERSECTION LEVELS OF SERVICE

Study Intersections	Level of Service		
	Existing[1] Weekday 4:30-5:30 p.m.	Existing[1] Plus Project Weekday 4:30-5:30 p.m.	Cumulative Plus Project[2] Weekday 4:30-5:30 p.m.
Mariposa Street (cont.)			
▸ I-280 off-ramp	B	B	B
▸ Third Street	B	B	B
▸ Illinois Street	A	A	A
Potrero Avenue at:			
▸ Tenth/Brannan/Division	B	B	B
Third/Fourth Streets	B	B	F
Market Street at:			
▸ Fourth/Stockton/Ellis	B	B	B
▸ Third/Kearny/Geary	F	F	B
Third/Cesar Chavez (Army) Sts.	D	D	E
Third/Jamestown Streets	B	B	A
Mission Street at:			
▸ 4th Street	B	B	B
▸ 3rd Street	F	F	B
Embarcadero/Broadway	C	C	C

Notes:
N/A = Intersection not analyzed during this time period.
1. Existing traffic volumes have been redistributed to account for roadway improvements under construction, to be completed by 2000.
2. Levels of Service under cumulative plus project conditions could be better than existing plus project conditions because signal timing along study arterials was optimized under cumulative conditions.

Source: Wilbur Smith Associates.

intersections currently operate at LOS E and 17 operate at LOS F. On a non-game day, project traffic would result in a decline in level of service from LOS D to LOS F at the intersection of Harrison Street with The Embarcadero.

SOURCE: Wilbur Smith Associates

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Figure IV.E.6 Existing + Project LOS
Non-Game Day Scenario (4:30 - 5:30 p.m.)

During the p.m. peak hour period from 4:30 - 5:30 p.m. on a non-game weekday, cumulative (year 2015)-plus-project traffic would result in 11 more of the 66 intersections experiencing a decline in level of service to LOS E or LOS F compared to existing-plus-project conditions, four of which would decline from LOS E to F (see Table IV.E.26 and Figure IV.E.6). The 11 intersections are:

Intersection	Level of Service Change
Brannan Street at Third Street	C to F
Bryant Street at Main Street	D to E
Harrison Street at Main Street	D to F
Sixteenth Street at Potrero Avenue	C to F
Third Street at Fourth Street	B to F
Townsend Street at Third Street	E to F
Folsom Street at Sixth Street	E to F
Folsom Street at Second Street	E to F
Folsom Street at The Embarcadero	E to F
Sixteenth Street at Third Street	B to F
Third Street at Cesar Chavez	D to F

Six intersections show an improved LOS under cumulative-plus-project conditions when compared to the existing-plus-project scenario. This is due to the construction of planned street network improvements and the adjustment (optimization) of traffic signal timing. Therefore, a total of 22 intersections would operate below LOS D compared to existing-plus-project conditions in 2015.

UCSF/Mission Bay Cumulative Intersection Impacts

Base cumulative-plus-project and UCSF/Mission Bay cumulative-plus-project intersection levels of service are shown in Table IV.E.27. The methodology and assumptions used in calculating the UCSF/Mission Bay cumulative intersection levels of service were similar to those in the base cumulative levels of service calculation, using travel demand numbers for the larger growth scenario as described on pp. IV.108 - IV.110.

TABLE IV.E.27●
SUMMARY OF INTERSECTION LEVELS OF SERVICE
UCSF/MISSION BAY CUMULATIVE WITH PROJECT CONDITIONS

Study Intersections	Cumulative with Project				Cumulative (UCSF) With Project			
	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Berry Street at:								
▸ Third Street	F	A	N/A	N/A	F	A	N/A	N/A
King Street at:								
▸ Fourth Street	B	F	B	B	C	F	B	C
▸ Third Street	F	B	B	E	F	B	B	F
▸ Second Street	C	B	B	B	C	B	B	B
Townsend Street at:								
▸ Eighth/HenryAdams/Division	C	B	B	C	F	F	C	F
▸ Fourth Street	B	F	B	B	B	F	B	B
▸ Third Street	F	B	A	E	F	B	A	F
▸ Second Street	B	B	B	B	B	B	B	B
▸ The Embarcadero	C	B	B	C	C	B	B	C
Brannan Street at:								
▸ Sixth Street/I-280 Ramps	B	B	B	B	B	B	B	B
▸ Fifth Street	C	B	B	B	C	B	B	B
▸ Fourth Street	B	D	B	B	B	E	B	B
▸ Third Street	F	B	B	F	F	B	B	F
▸ Second Street	B	B	B	B	B	B	B	B
▸ The Embarcadero	B	A	A	B	B	A	A	B
Bryant Street at:								
▸ Seventh Street	B	B	N/A	N/A	C	B	N/A	N/A
▸ Sixth Street	F	F	B	B	F	F	B	B
▸ Fifth Street	F	F	B	B	F	F	B	B
▸ Fourth Street	B	F	B	E	C	F	B	E
▸ Third Street	F	B	F	F	F	B	F	F
▸ Second Street	F	B	B	B	F	B	B	B
▸ Main Street	D	C	N/A	N/A	D	C	N/A	N/A
▸ The Embarcadero	C	B	C	B	D	C	C	B

TABLE IV.E.27●
SUMMARY OF INTERSECTION LEVELS OF SERVICE
UCSF/MISSION BAY CUMULATIVE WITH PROJECT CONDITIONS

Study Intersections	Cumulative with Project				Cumulative (UCSF) With Project			
	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Harrison Street at:								
▸ Seventh Street	B	B	B	B	B	B	B	B
▸ Sixth Street	C	B	B	B	C	B	B	B
▸ Fifth Street	C	D	B	B	C	D	B	B
▸ Fourth Street	F	F	B	C	F	F	B	D
▸ Third Street	F	C	C	F	F	F	D	F
▸ Second Street	F	F	N/A	N/A	F	F	N/A	N/A
▸ Essex Street at I-80 on-ramp	F	B	A	B	F	C	A	B
▸ First Street	F	F	B	C	F	F	B	C
▸ Fremont Street	F	F	N/A	N/A	F	F	N/A	N/A
▸ Main Street	F	E	B	B	F	E	B	B
▸ The Embarcadero	F	D	B	F	F	D	B	F
Folsom Street at:								
▸ Sixth Street	F	F	N/A	N/A	F	F	N/A	N/A
▸ Fourth Street	E	F	N/A	N/A	F	F	N/A	N/A
▸ Third Street	C	B	N/A	N/A	C	B	N/A	N/A
▸ Second Street	F	D	N/A	N/A	F	D	N/A	N/A
▸ First Street	D	B	N/A	N/A	D	B	N/A	N/A
▸ Fremont Street	B	A	N/A	N/A	B	A	N/A	N/A
▸ Main Street	B	B	N/A	N/A	B	B	N/A	N/A
▸ The Embarcadero	F	F	B	F	F	F	B	F
Howard Street at:								
▸ Sixth Street	F	C	N/A	N/A	F	C	N/A	N/A
▸ Fourth Street	C	C	N/A	N/A	C	C	N/A	N/A
▸ Third Street	B	B	N/A	N/A	B	B	N/A	N/A
Sixteenth Street at:								
▸ Potrero Avenue	F	C	B	C	F	F	B	C
▸ Vermont Street	D	B	N/A	N/A	F	D	N/A	N/A
▸ Rhode Island Street	D	C	N/A	N/A	F	F	N/A	N/A

TABLE IV.E.27●
SUMMARY OF INTERSECTION LEVELS OF SERVICE
UCSF/MISSION BAY CUMULATIVE WITH PROJECT CONDITIONS

Study Intersections	Cumulative with Project				Cumulative (UCSF) With Project			
	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Sixteenth Street at: (cont.)								
▸ Mississippi/7th/Pennsylvania	D	B	N/A	N/A	F	F	N/A	N/A
▸ Third Street	F	F	B	F	F	F	C	F
▸ Illinois Street	F	B	N/A	N/A	F	C	N/A	N/A
Mariposa Street at:								
▸ Vermont Street	B	B	N/A	N/A	C	C	N/A	N/A
▸ De Haro Street	A	A	N/A	N/A	F	E	N/A	N/A
▸ Pennsylvania/I-280 on-ramp	C	B	N/A	N/A	F	F	A	B
▸ I-280 off-ramp	B	B	A	A	F	F	A	C
▸ Third Street	F	D	F	F	F	F	F	F
▸ Illinois Street	C	F	B	B	F	F	B	C
Potrero Avenue at:								
▸ Tenth/Brannan/Division	B	B	B	C	B	B	B	C
Third/Fourth Streets	F	F	F	F	F	F	F	F
Market Street at:								
▸ Fourth/Stockton/Ellis	B	B	B	B	B	B	B	B
▸ Third/Kearny/Geary	B	B	B	B	B	B	B	B
Third/Cesar Chavez (Army) Streets	F	B	B	C	F	B	B	C
Third/Jamestown Streets	A	A	A	A	A	A	A	A
Mission Street at:								
▸ Fourth Street	B	B	N/A	N/A	B	B	N/A	N/A
▸ Third Street	B	B	N/A	N/A	B	B	N/A	N/A
The Embarcadero/Broadway	D	E	B	C	D	E	B	C

Note:
N/A = Intersection not analyzed during this time period

Source: Wilbur Smith Associates.

Weekday Afternoon (3:30 - 4:30 p.m.) Post-Day Game

Compared with base cumulative-plus-project conditions, the level of service under UCSF/Mission Bay cumulative-plus-project conditions would deteriorate to LOS F at nine additional intersections. These intersections are:

Intersection	Level of Service Change
■ Townsend Street at Eighth/Henry Adams Street	C to F
■ Folsom Street at Fourth Street	E to F
■ Sixteenth Street at Vermont Street	D to F
■ Sixteenth Street at Rhode Island Street	D to F
■ Sixteenth Street at Mississippi Street	D to F
■ Mariposa Street at De Haro Street	A to F
■ Mariposa Street at Pennsylvania Street	C to F
■ Mariposa Street at NB I-280 Off-ramp	B to F
■ Mariposa Street at Illinois Street	C to F

Thus, the UCSF/Mission Bay cumulative scenario with ballpark traffic would result in a total of 35 intersections operating at LOS E or F in the year 2015.

Weekday Evening (6:30 - 7:30 p.m.) Pre-Night Game

During the weekday evening pre-game period (6:30 - 7:30 p.m.), additional traffic generated by UCSF/Mission Bay development with ballpark traffic would cause ten more intersections to deteriorate to LOS E or F compared to base cumulative-plus-project conditions. These intersections are:

Intersection	Level of Service Change
■ Townsend Street at Eighth/Henry Adams Street	B to F
■ Brannan Street at Fourth Street	D to E
■ Harrison Street at Third Street	C to F
■ Sixteenth Street at Potrero Street	C to F
■ Sixteenth Street at Rhode Island Street	D to F

■ Sixteenth Street at Mississippi/7th Street	B to F
■ Mariposa Street at De Haro Street	A to E
■ Mariposa Street at Pennsylvania Street	B to F
■ Mariposa Street at NB I-280 Off-ramp	B to F
■ Mariposa Street at Third Street	D to F

This second cumulative scenario would result in 27 intersections operating at LOS E or F compared with 17 under the base cumulative-plus-project scenario.

Weekday Night (10:30 - 11:30 p.m.) Post-Night Game

During the hour after weekday night games (10:30 - 11:30 p.m.), no more of the study intersections would experience further decline in level of service to LOS E or F, compared with base cumulative-plus-project conditions.

Weekend Afternoon (Saturday 4:00 - 5:00 p.m.) Post-Game

During the hour after weekend afternoon games, UCSF/Mission Bay cumulative-plus-project traffic would cause three additional intersections to deteriorate to LOS F, compared to base cumulative-plus-project conditions. These intersections include:

Intersection	**Level of Service Change**
■ King Street at Third Street	E to F
■ Townsend Street at Eighth/Henry Adams	C to F
■ Townsend Street at Third Street	E to F

The result, with two of the three new LOS F intersections deteriorating from the already low E service level, would be 12 intersections operating below LOS D in 2015 with the larger cumulative growth scenario (this assumes that the intersection of Bryant Street at Fourth Street would be LOS E, as it would be in the base cumulative-plus-project analyses.)

Non-Game Day Conditions

Non-game day intersection levels of service for the p.m. peak hour (4:30 - 5:30 p.m.) under UCSF/Mission Bay cumulative-plus-project conditions are shown in Table IV.E.28. Compared with the base cumulative-plus-project scenario, the level of service of 13 intersections would deteriorate to LOS E or F for a total of 35 intersections at LOS E or F during the weekday p.m. peak hour. These 13 intersections are:

Intersection	Level of Service Change
■ Townsend Street at Eighth/Henry Adams Street	C to F
■ Townsend Street at The Embarcadero	D to E
■ Brannan Street at Second Street	D to F
■ Harrison Street at Third Street	D to F
■ Folsom Street at Fourth Street	D to E
■ Folsom Street at First Street	D to E
■ Sixteenth Street at Rhode Island Street	D to F
■ Sixteenth Street at Mississippi/7th Street	D to F
■ Sixteenth Street at Illinois Street	A to E
■ Mariposa Street at De Haro Street	A to F
■ Mariposa Street at Pennsylvania Street	C to F
■ Mariposa Street at NB I-280 Off-ramp	B to F
■ Mariposa Street at Third Street	B to F

PROJECT TRANSIT IMPACTS

This subsection analyzes impacts of the proposed ballpark travel on the various transit systems that now serve or could serve the ballpark site. Local transit service would be from the MUNI existing bus service to the area, planned service expansions, and additional service assumed to be similar to the existing Ballpark Express service. CalTrain also serves the ballpark area. BART service is analyzed assuming that patrons would use BART and either walk or take the MUNI "bus bridge" (described below on pp. IV.185 - IV.189) to the ballpark. Other regional transit services, such as Golden Gate Transit, AC Transit, and SamTrans and regional ferry operations are also reviewed.

TABLE IV.E.28
WEEKDAY NON-GAME DAY
UCSF/MISSION BAY CUMULATIVE INTERSECTION LEVELS OF SERVICE

Study Intersections	Level of Service	
	Base Cumulative Plus Project Weekday 4:30-5:30 p.m.	UCSF Cumulative Plus Project Weekday 4:30-5:30 p.m.
Berry Street at:		
► Third Street	A	A
King Street at:		
► Fourth Street	B	B
► Third Street	B	C
► Second Street	B	C
Townsend Street at:		
► Eighth/Henry Adams/Division	C	F
► Fourth Street	C	D
► Third Street	F	F
► Second Street	B	B
► The Embarcadero	D	E
Brannan Street at:		
► Sixth Street/I-280 Ramps	E	E
► Fifth Street	C	C
► Fourth Street	C	D
► Third Street	F	F
► Second Street	D	F
► The Embarcadero	A	A
Bryant Street at:		
► Seventh Street	B	C
► Sixth Street	C	C
► Fifth Street	F	F
► Fourth Street	B	C
► Third Street	B	B
► Second Street	F	F
► Main Street	E	E
► The Embarcadero	C	D

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TABLE IV.E.28
WEEKDAY NON-GAME DAY
UCSF/MISSION BAY CUMULATIVE INTERSECTION LEVELS OF SERVICE

Study Intersections	Level of Service	
	Base Cumulative Plus Project Weekday 4:30-5:30 p.m.	UCSF Cumulative Plus Project Weekday 4:30-5:30 p.m.
Harrison Street at:		
▸ Seventh Street	B	B
▸ Sixth Street	C	C
▸ Fifth Street	C	C
▸ Fourth Street	F	F
▸ Third Street	D	F
▸ Second Street	F	F
▸ Essex Street at I-80 on-ramp	F	F
▸ First Street	F	F
▸ Fremont Street	F	F
▸ Main Street	F	F
▸ The Embarcadero	F	F
Folsom Street at:		
▸ Sixth Street	F	F
▸ Fourth Street	D	E
▸ Third Street	B	B
▸ Second Street	F	F
▸ First Street	D	E
▸ Fremont Street	A	A
▸ Main Street	B	B
▸ The Embarcadero	F	F
Howard Street at:		
▸ Sixth Street	F	F
▸ Fourth Street	B	B
▸ Third Street	C	C
Sixteenth Street at:		
▸ Potrero Avenue	F	F
▸ Vermont Street	F	F
▸ Rhode Island Street	D	F
▸ Mississippi/7th/Pennsylvania	D	F

TABLE IV.E.28
WEEKDAY NON-GAME DAY
UCSF/MISSION BAY CUMULATIVE INTERSECTION LEVELS OF SERVICE

Study Intersections	Level of Service	
	Base Cumulative Plus Project Weekday 4:30-5:30 p.m.	UCSF Cumulative Plus Project Weekday 4:30-5:30 p.m.
Sixteenth Street at: (cont.)		
▸ Third Street	F	F
▸ Illinois Street	A	E
Mariposa Street at:		
▸ Vermont Street	B	C
▸ DeHaro Street	A	F
▸ Pennsylvania/I-280 on-ramp	C	F
▸ I-280 off-ramp	B	F
▸ Third Street	B	F
▸ Illinois Street	A	C
Potrero Avenue at:		
▸ Tenth/Brannan/Division	B	B
Third/Fourth Streets	F	F
Market Street at:		
▸ Fourth/Stockton/Ellis	B	B
▸ Third/Kearny/Geary	B	C
Third/Cesar Chavez (Army) Sts.	E	E
Third/Jamestown Streets	A	A
Mission Street at:		
▸ Fourth Street	B	B
▸ Third Street	B	B
The Embarcadero/Broadway	C	D

Source: Wilbur Smith Associates.

Municipal Railway

The analysis of impacts on MUNI passenger loads (load factor) is based on available weekday peak hour ridership data, applied to the analysis of the following weekday afternoon and weekday night time periods: 3:30 to 4:30 p.m., 4:30 to 5:30 p.m., and 6:30 to 7:30 p.m. That is, projected ridership generated by the project for these study time periods is added to the "existing" peak hour ridership. This approach provides a conservative analysis because project transit demand is added to the largest daily ridership on MUNI rather than to the somewhat smaller ridership that is usually found before and after the p.m. peak.

For purposes of analysis, project impacts on MUNI service would have two components: first, an incremental impact on passenger loads on existing MUNI bus lines, measured at the maximum load points; and second, a demand on what would be a new shuttle service between the ballpark and Market Street, including both the MUNI Metro Extension (MMX) and a "bus bridge" and on certain transit priority improvements as described below.

As noted above, some assumptions were made as to the level of additional transit services which would be provided to serve the ballpark in order to take advantage of the transit facilities which would be in existence and available. Except for minor improvements, the base case would not require new capital expenditures for facilities and equipment. However, in some cases, the base case stipulates more service than what would be provided if there were no ballpark. These cases are noted in the text. The result of assuming additional service is that MUNI and other transit operators would experience greater operating expenses due to the service added to accommodate ballpark patrons. Absent additional funds, service in other areas of the City might need to be temporarily reduced somewhat in order to accommodate ballpark demand on some game days.

Existing-plus-Project Impacts on MUNI Service

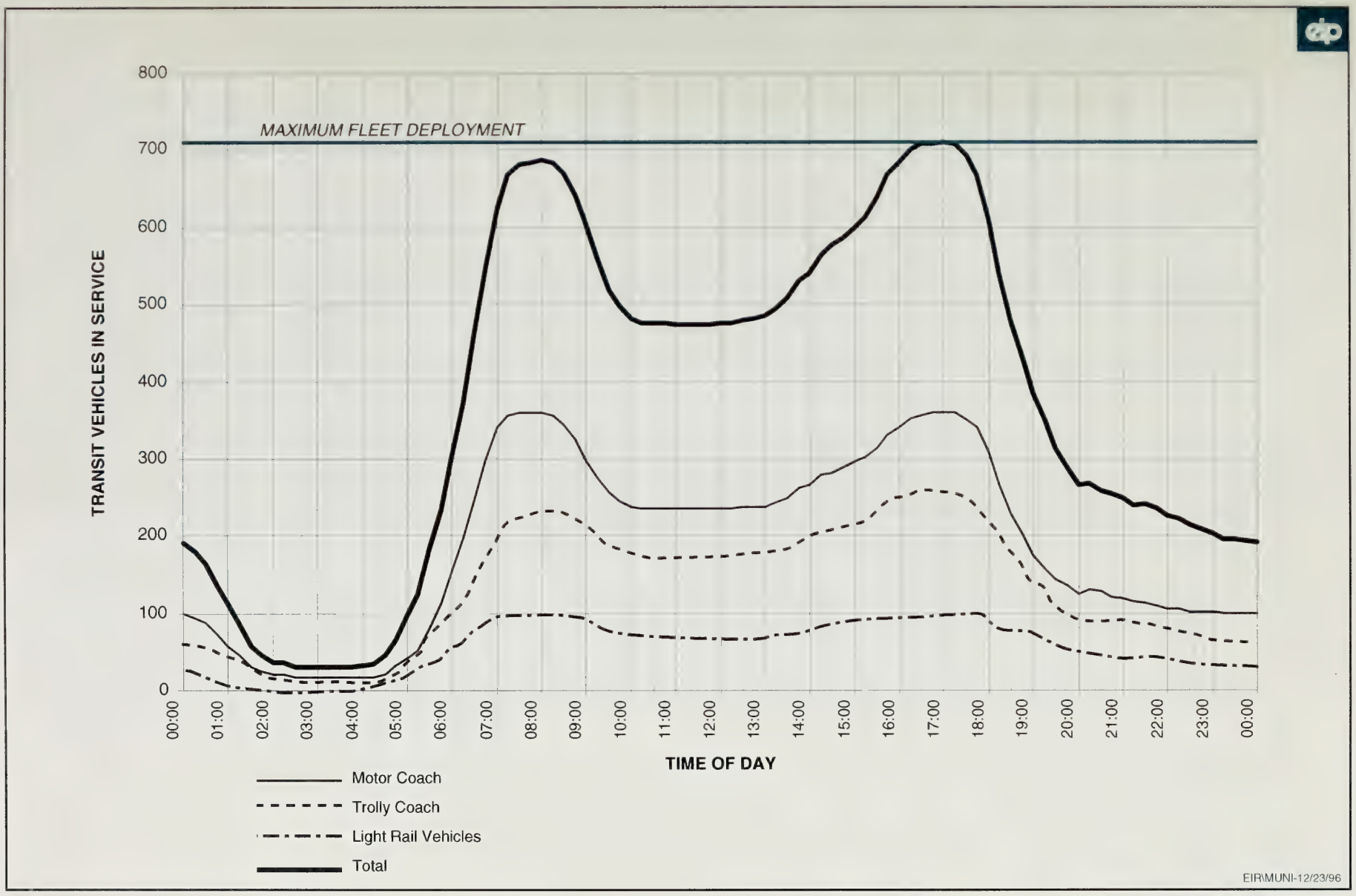
Transit Capacity

For the impact analysis, no change is assumed in the existing MUNI fleet size. In addition to regular weekday service, MUNI currently provides 14 to 27 buses for Ballpark Express service, and it is assumed that vehicles would be available for a "bus bridge" or route supplement service as follows: 14 for pre-weekday night games, 19 for weekday afternoon games, 19 for post weekday night games, and 27 for weekend day games. Also, during certain non-peak periods, undeployed buses from MUNI's normal peak fleet may be available for ballpark-related service.

Figure IV.E.7 depicts the current deployment of MUNI buses and MUNI Metro light rail vehicles (LRVs) in weekday service, based on information provided by the MUNI Operations Department. Maximum deployment of vehicles occurs during the 4:00 - 6:00 p.m. period on normal weekdays, partially overlapping with the weekday afternoon game departure and weekday night game arrival periods. After weekday night games, a substantial number of undeployed vehicles (over 250) from MUNI's fleet are potentially available for service. (See the Background Transportation Report for detail of undeployed MUNI vehicles by type and time of day for a normal weekday.)

Project Impacts

Analysis of transit impacts begins with calculation of the increase in transit patronage in the primary direction of ballpark travel for the four time periods used in the analysis. Increases are measured at four MUNI screenlines and one subscreenline (Market Street) described on pp. III.92 - III.94. These screenlines are shown in the Background Transportation Report, Figure 2-16, following p. 2-29.



SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure IV.E.7 MUNI Fleet Deployment by Time of Day

The screenlines developed for analysis of impacts on the MUNI system in previous EIRs generally measure radial lines carrying riders from the downtown area to other quadrants of the City, and represent the vast majority of demand and service on MUNI in the peak hours. The screenlines measure aggregate travel on combinations of MUNI lines that lead to various regions of the City. The points of measurement of the project impact on a transit corridor do not necessarily occur at the physical intersection of the transit lines with the screenline. Rather, they reflect the Maximum Load Point for each of the lines that cross a screenline, which might occur on either side of a screenline.

Table IV.E.29 indicates the estimated MUNI patronage occurring across each screenline because of added ballpark traffic for the four analysis time periods. This only considers trips made on existing transit lines and examines demand on the proposed "bus bridge" to be discussed later in this section. The table also indicates the passenger increase on the four screenlines caused by the ballpark. The northwest screenline is affected the most, although it also has the most lines and greatest capacity.

The impact of these added passengers on system capacity and possible need for additional line-haul service cannot be precisely estimated for all time periods within the scope of this study, due to the lack of availability of off-peak passenger load data. However, passenger load information is available for the p.m. peak hour (4:30 - 5:30 p.m.) for most MUNI radial lines. The peak hour falls between the ballpark weekday afternoon post-game (3:30 - 4:30 p.m.) and weekday night pre-game periods (6:30 - 7:30 p.m.). A "worst case" analysis of ballpark patronage impacts is presented by overlaying added ballpark patronage on existing peak hour patronage and comparing this demand with peak capacity. This approach also provides a benchmark for estimating the ballpark's impact on line-haul services at other times.

TABLE IV.E.29 ●
WORST CASE IMPACT ON MUNI AND STREETCARS BY SCREENLINE LOCATIONS – 1996 WITH PROJECT WEEKDAY POST-GAME DEPARTURES COINCIDING WITH COMMUTER PEAK (4:30-5:30 PM)

Screenline	MUNI Routes	Hourly Capacity[1]	Existing Hourly Load	Added Ballpark Trips	Load with Ballpark Trips	Existing Percent Capacity Utilized	Percent Capacity Utilized with Ballpark
Northeast	15 (ib)[2], 30 (ib), 30X (ob)[2], 32 (ib), 42 (ib), 45	4,222	2,081	674	2,755	49%	65%
Northwest	1, 2, 5, 21, 31, 38, 38L	4,501	3,684	319	4,003	82%	89%
Southwest	6, 7, 12, 14, 66, 71, F, J, K, L, M, N	9,504	6,329	1,463	7,792	67%	82%
Southeast	9, 14X, 15 (ob), 30 (ob), 32[3] (ob), 42 (ob), 80X[3], 81X[3], 82X	4,958	2,703	499	2,303	55%	65%
South of Market	15, 30, 42, 45,82X, MMX, bus bridge	13,149	2,280	9,296	11,576	17%	88%

Notes:
1. Capacity based on published MUNI timetables, Fall 1996, and may not include the impact of missed or late runs, as a typical day's actual capacity would be 4 to 5 percent lower than scheduled capacity under current conditions.
2. ib = inbound; ob = outbound
3. With the implementation of the MMX light rail service, MUNI lines 32, 80X and 81X would not pass the Southeast screenline.

Source: Wilbur Smith Associates.

Table IV.E.29 summarizes the results of the impact analysis. Under this scenario, adding ballpark-related travel to existing p.m. peak hour MUNI loads, none of the screenlines are forecast to be over capacity although individual lines could be.

Cumulative-plus-Project Impacts on MUNI Service

As discussed on pp. IV.105 - IV.108, a number of new development programs are proposed in the areas surrounding the ballpark site. Cumulative transit impacts in the ballpark study area include assumptions of transit ridership from these proposed development projects. An adjustment was made to assure that the total transit trips crossing the regional screenlines was consistent with the results of the MTC model for the year 2015. MUNI trips generated

by these developments were disaggregated to individual routes (see the Transportation Background Report for additional detail), and an additional increment of ridership was added to reflect the total areawide growth forecast by the MTC model. Four columns of Table IV.E.30 show cumulative impacts of growth without and with ballpark ridership.

The year 2015 cumulative scenario assumes that the MUNI Third Street Light Rail extension (LRT) would be in place and would extend south from King Street along Fourth Street in the southbound direction and Third Street in the northbound direction, with the two one-way sections joining and continuing south in a two-way configuration on Third Street south of the Fourth Street intersection. The MTC model runs used for evaluating the cumulative impacts also assume a similar Third Street LRT. The transit ridership estimate therefore includes consideration of the Bayshore Extension. The Third Street LRT is not expected to have a substantial impact on transit use to ballpark events. It would provide access to the ballpark for persons along the Third Street corridor to the south. It would also substantially improve regional access to the portion of the Mission Bay area which is south of China Basin Channel.

Cumulative development by the year 2015 would add approximately 740 bus passengers and 250 MUNI Metro passengers at the four outer screenlines during the p.m. peak (4:30 - 5:30 p.m.) period. When transfers to BART and the various Downtown-oriented MUNI lines are considered, nearly 1,000 patrons would be added to the South of Market screenline, which would be at 91 percent of capacity as shown in Table IV.E.30. Transit utilization at two of the five screenlines would exceed 90 percent, with the northwest screenline showing 93 percent utilization. The combination of this travel and ballpark transit use would cause two bus lines and four MUNI Metro lines to exceed maximum load standards. Line 45 would require the equivalent of approximately two additional vehicle trips in this time period, while the 30 line would require five. MUNI Metro Lines K, L, and M would require two additional cars during the peak hour, while Line N is seen to require one additional car in line-haul service as a result of cumulative impacts. MUNI would experience additional operating costs to put these vehicles into service from its available fleet.

Screenline	MUNI Routes	C	Percent Cap. Util. With Ballpark	Cumulative Cap. Util. Without Ballpark	Cumulative Cap. Util. With Ballpark
Northeast	15 (ib), 30 (ib), 30X 32 (ib), 42 (ib), 45		65%	54%	70%
Northwest	1, 2, 5, 21, 31,38, 38L		89%	86%	93%
Southwest	6, 7, 12, 14, 66, 71 F, J, K, L, M, N		82%	71%	86%
Southeast	9, 14X, 15 (ob), 30 (ob) 32 (ob), 42 (ob), 82X		59%	53%	62%
South of Market	15, 30, 32, 42, 45, 82X, MMX Bus Bridge & Transfers		85%	N/A	91%

Notes:

1. Capacity based on published MUNI timetable han scheduled capacity under current conditions.
2. ib = inbound; ob = outbound

Source: Telephone conversation with David Mak

TABLE IV.E.30 ●
WORST CASE IMPACT ON MUNI BUS AND STREETCAR LINES – YEAR 2015 CUMULATIVE CONTEXT
WEEKDAY POST-GAME DEPARTURES COINCIDING WITH COMMUTER PEAK

Screenline	MUNI Routes	Hourly Capacity[1]	Existing Hourly Load	Added Ballpark Trips	Mission Bay Trips	Rincon Sports Trips	Rincon Point Trip	Water-Front Trips	Load With Ballpark Trips	Cumulative Trips Without Ballpark	Cumulative Trips With Ballpark	Existing % Capacity Utilized	Percent Cap. Util. With Ballpark	Cumulative Cap. Util. Without Ballpark	Cumulative Cap. Util. With Ballpark
Northeast	15 (ib), 30 (ib), 30X 32 (ib), 42 (ib), 45	4,222	2,081	674	17	66	33	100	2,755	2,297	2,971	49%	65%	54%	70%
Northwest	1, 2, 5, 21, 31,38, 38L	4,501	3,684	319	11	46	61	67	4,003	3,869	4,188	82%	89%	86%	93%
Southwest	6, 7, 12, 14, 66, 71 F, J, K, L, M, N	9,504	6,329	1,463	115	50	96	132	7,792	6,722	8,185	67%	82%	71%	86%
Southeast	9, 14X, 15 (ob), 30 (ob) 32 (ob), 42 (ob), 82X	5,446	2,703	499	60	34	29	69	3,202	2,895	3,394	50%	59%	53%	62%
South of Market	15, 30, 32, 42, 45, 82X, MMX Bus Bridge & Transfers	13,637	2,280	9,296	205	210	273	141	11,576	3,109	12,405	N/A	85%	N/A	91%

Notes:
1. Capacity based on published MUNI timetables, Fall 1996, and may not include the impact of missed or late runs, as a typical day's actual capacity would be 4 to 5 percent lower than scheduled capacity under current conditions.
2. ib = inbound; ob = outbound

Source: Telephone conversation with David Makofsky, MUNI schedules, Data Service, 1/2/97; and Wilbur Smith Associates.

Cumulative UCSF/Mission Bay 2015 Scenario

The cumulative transit impacts were evaluated for the UCSF/Mission Bay 2015 cumulative scenario which includes a new UCSF campus and a land use plan for the remainder of Mission Bay south of the Channel. Under this scenario, cumulative development by the year 2015 would add approximately 1,300 bus passengers and 500 MUNI Metro passengers at the four outer screenlines during the p.m. peak (4:30 - 5:30 p.m.) period. When transfers to BART and the various Downtown-oriented MUNI lines are considered, nearly 2,400 patrons would be added to the South of Market screenline. As shown in Table IV.E.31, transit utilization at two of the five screenlines would exceed 90 percent, with the South of Market screenlines reaching 100 percent of capacity and the northwest screenline reaching 99 percent of capacity. The combination of this cumulative growth in transit demand and ballpark transit demand would cause three bus lines and four MUNI Metro lines to exceed maximum load standards. Bus Line 45 would require the equivalent of approximately four additional vehicle trips in this time period, while the 30-Stockton line would require seven and the 42-Downtown Loop would need one additional trip. MUNI Metro Lines L and M would require two additional cars during the peak hour, while Line K would require three additional cars in line-haul service and Line N one, as a result of cumulative impacts under the UCSF/Mission Bay development scenario, with ballpark travel.

The portion of the Mission Bay project south of China Basin Channel would have north-south transit access via the Bayshore Light Rail line and some east-west access via the 22 bus route in the Sixteenth Street corridor. Development in this area under the UCSF/Mission Bay cumulative scenario would generate substantial additional demand for these transit services. During the 4:30 to 5:30 p.m. weekday peak hour as many as 2,500 additional riders would use the Third Street Light Rail and 500 would use the 22 bus route. Serving this volume on the Bayshore Light Rail would require two-car trains every eight minutes in the peak direction. A similar amount of service would be required on the 22 line. These service additions would be incremental to the base level of service that would already be available on these lines. For example, if the base level of service on the Bayshore Light Rail was a one-

WORST

Screenline	MUNI Routes	ing acity zed	Percent Cap. Util. With Ballpark	Cumulative Cap. Util. Without Ballpark	Cumulative Cap. Util. With Ballpark
Northeast	15 (ib)[2], 30 (ib), 30X (ob)[2], 32 (ib), 42 (ib), 45	49%	65%	61%	77%
Northwest	1, 2, 5, 21, 31,38, 38L	82%	89%	92%	99%
Southwest	6, 7, 12, 14, 66, 71 F, J, K, L, M, N	67%	82%	72%	87%
Southeast	9, 14X, 15 (ob), 30 (ob) 32 (ob), 42 (ob), 82X	50%	59%	54%	63%
South of Market	15, 30, 32, 42, 45, 82X, MMX Bus Bridge & Transfers	N/A	85%	N/A	100%

Notes:
1. Capacity based on published MUNI timetables, Fa cheduled capacity under current conditions.
2. ib = inbound; ob = outbound

Source: Telephone conversation with David Makofsky

TABLE IV.E.31 ●
WORST CASE IMPACT ON MUNI BUS AND STREETCAR LINES – YEAR 2015 UCSF/MISSION BAY CUMULATIVE CONTEXT
WEEKDAY POST-GAME DEPARTURES COINCIDING WITH COMMUTER PEAK

Screenline	MUNI Routes	Hourly Capacity[1]	Existing Hourly Load	Added Ballpark Trips	Mission Bay Trips	Rincon Sports Trips	Rincon Point Trip	Water-Front Trips	Load With Ballpark Trips	Cumulative Trips Without Ballpark	Cumulative Trips With Ballpark	Existing % Capacity Utilized	Percent Cap. Util. With Ballpark	Cumulative Cap. Util. Without Ballpark	Cumulative Cap. Util. With Ballpark
Northeast	15 (ib)[2], 30 (ib), 30X (ob)[2], 32 (ib), 42 (ib), 45	4,222	2,081	674	310	66	33	100	2,755	2,590	3,264	49%	65%	61%	77%
Northwest	1, 2, 5, 21, 31,38, 38L	4,501	3,684	319	287	46	61	67	4,003	4,145	4,464	82%	89%	92%	99%
Southwest	6, 7, 12, 14, 66, 71 F, J, K, L, M, N	9,504	6,329	1,463	233	50	96	132	7,792	6,840	8,303	67%	82%	72%	87%
Southeast	9, 14X, 15 (ob), 30 (ob) 32 (ob), 42 (ob), 82X	5,446	2,703	499	94	34	29	69	3,202	2,929	3,428	50%	59%	54%	63%
South of Market	15, 30, 32, 42, 45, 82X, MMX Bus Bridge & Transfers	13,637	2,280	9,296	1,363	205	210	273	11,576	4,331	13,627	N/A	85%	N/A	100%

Notes:
1. Capacity based on published MUNI timetables, Fall 1996, and may not include the impact of missed or late runs, as a typical day's actual capacity would be 4 to 5 percent lower than scheduled capacity under current conditions.
2. ib = inbound; ob = outbound

Source: Telephone conversation with David Makofsky, MUNI schedules, Data Service, 1/2/97; and Wilbur Smith Associates.

car train every 15 minutes, the added transit trips from the UCSF/Mission Bay cumulative growth plus ballpark transit trips would require two-car trains at six-minute headways. While the capacity to operate this level of service would be available on the Bayshore line, the system-wide operating requirements of this level of service would likely require MUNI to increase the number of trains that are through-routed from the Market Street subway to the MMX line and then to the Third Street light rail.

Bus Bridge and MUNI Extension

The greatest demand for transit service would occur between the ballpark and Market Street. This service is proposed to be provided by the MUNI Metro Extension (MMX) and a "bus bridge." The MMX service is assumed to primarily serve transfers to other MUNI Metro lines (plus through J-line trips). Some transfers to BART would also be served by the MMX line, but the bus bridge would be more convenient for this purpose. The bus bridge would be designed to serve other MUNI coach lines as well as BART and Golden Gate Transit transfer (riders of 15, 30, 42 and 45 lines would be served by their own lines; they are not assumed as part of the bus bridge demand).

Bus Bridge

To supplement the MUNI Metro Extension, a "bus bridge" would be created to provide access between Market Street and the ballpark, replacing the Ballpark Expresses that currently serve 3Com Park.

The proposed bus bridge route uses Second Street southbound and Third Street northbound. Buses would load and unload passengers in the ballpark area on the north side of King Street between Second and Third. The section of that block having a wide sidewalk suitable for loading could accommodate about eight standard or five to six articulated buses.

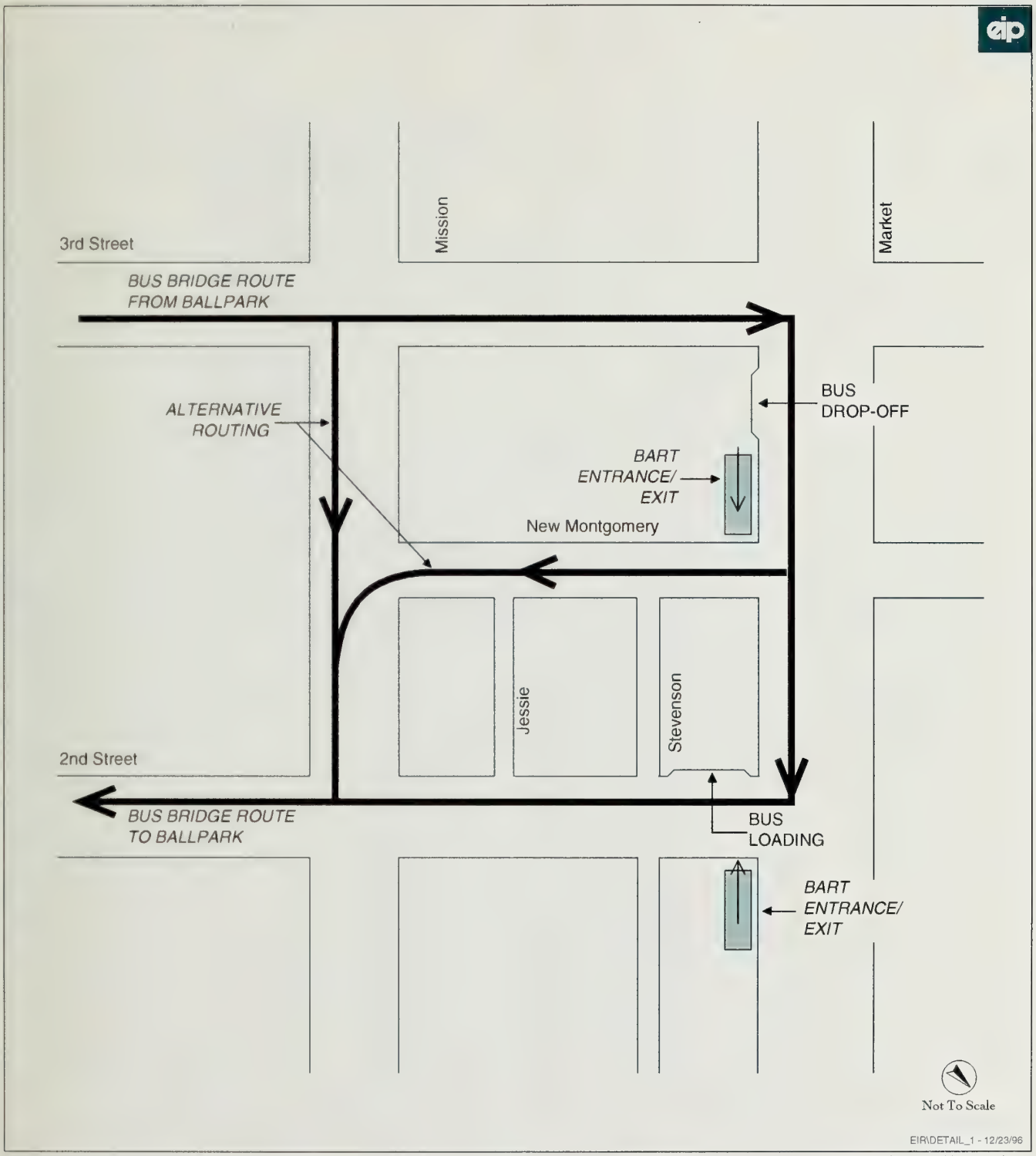
The bus bridge would most conveniently serve Montgomery Station BART passengers and fans who use Market Street buses. It would also serve passengers on Mission Street buses and transit passengers from the existing Transbay Terminal, who could walk one or two blocks to the bus bridge stop.

Figure IV.E.8 illustrates the Market Street section of the bus bridge. It is proposed that the buses load on Second Street between Market and Stevenson Streets. This area could accommodate three standard or two articulated buses. Persons coming from the game would off-load on either Market Street just east of Third Street or possibly at the current bus stop on Third Street which is used for the 15, 30 and 45 buses. An alternative during times when buses are close together would be for the second bus to off-load at the Second Street loading area across from the Second Street entrance to the BART station. This would avoid sending too large a group of fans into one BART entrance.

One alternative (which would avoid some traffic congestion but require longer walks) would be to have loading and possibly off-loading on Mission Street between New Montgomery Street and Second Street. Buses would be routed to that position via either Mission or New Montgomery Streets as shown in Figure IV.E.8. The operation of the south portion of the bus bridge is shown in Figure IV.E.9 (p. IV.188).

- An additional alternative would be for the Bus Bridge to use Second Street in both directions, looping between Third and Second Street at either end. This would avoid heavy traffic flows on Third Street after a game, although Second Street would also have substantial traffic attempting to access the I-80 freeway ramps.

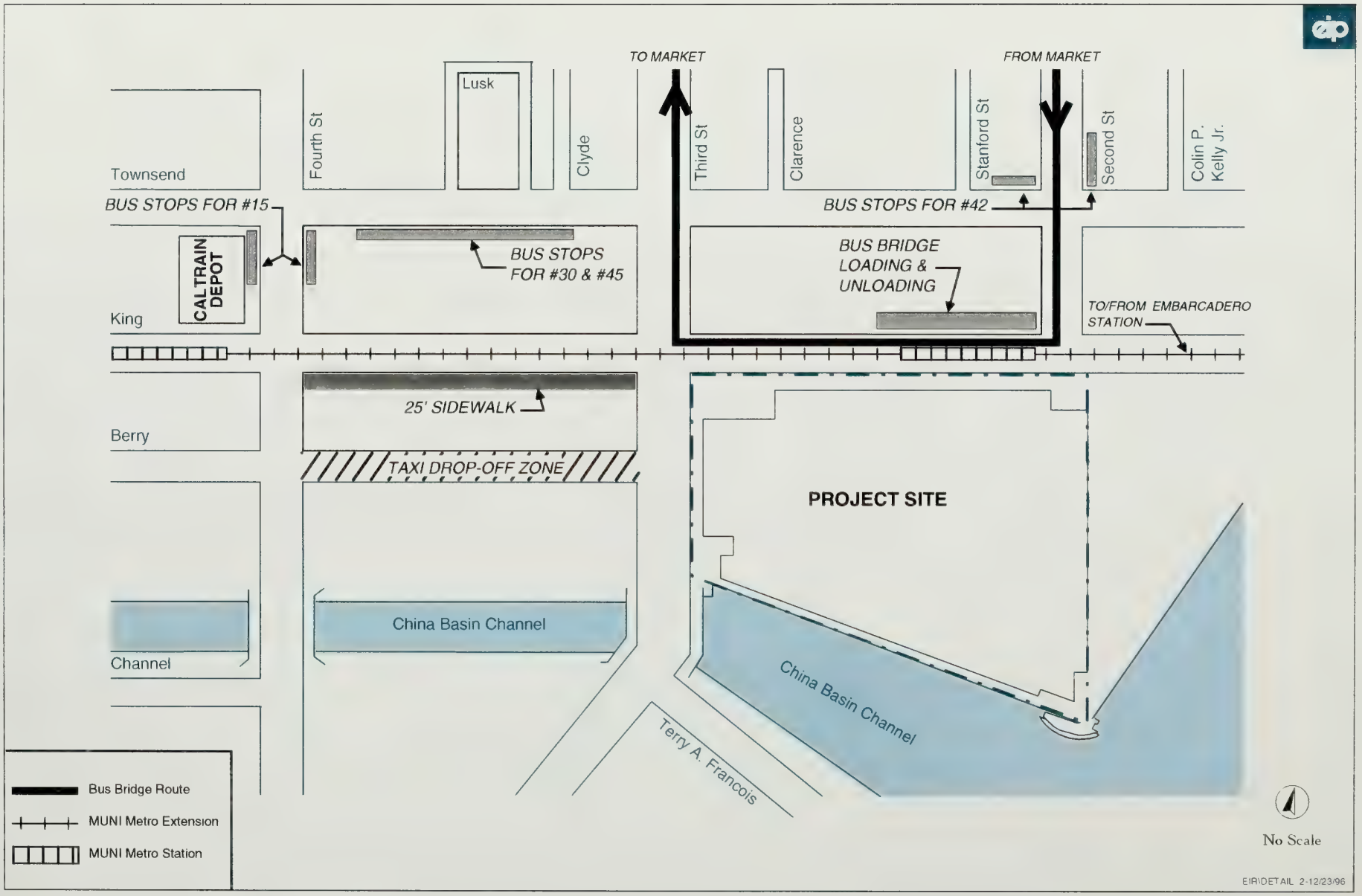
To estimate the cycle time of the bus bridge, speed/delay runs were made during the hours 12:30 - 1:30 p.m., 3:30 - 4:30 p.m. and 6:30 - 7:30 p.m. on Wednesday, October 30, 1996. Each time period had four to five runs which were made in a very consistent 12 minutes with little variation. However, one run at 6:30 p.m. took 24 minutes to complete because of extensive traffic congestion. Traffic control officers in that area had just gone off-duty, but there still was substantial downtown and Bay Bridge traffic at that time.



SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure IV.E.8 North Portion of Bus Bridge



SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure IV.E.9 Transit in Ballpark Vicinity

These runs indicate that a 15-minute cycle time (assuming three minutes for loading or unloading a bus) is achievable. The buses would not serve any intermediate bus stops between the ballpark and Market Street, and as a result these runs approximate actual running conditions for the buses. However, current traffic and the increased traffic generated by the ballpark on these routes indicate that some measures need to be taken to ensure a consistent travel time during congested traffic periods (see V.B., Transportation and Circulation, on transit priority, p. V.51).

It is assumed for this analysis that the bus bridge could use standard 40-ft. buses with a nominal capacity of 63 persons per bus, or 80 persons per bus under "crush load" conditions. Pre-game arrivals within an hour before a game are assumed to be spread out over an hour's time; thus, each vehicle could make four 15-minute round trips in bus bridge service before games. Under post-game conditions, departures in the first hour after a game are assumed to be concentrated within a half-hour period, meaning that bus bridge vehicles would be limited to two round-trips. Based on discussions with MUNI staff,[28] it was confirmed that nominal capacity standards (63 persons per bus) should be adhered to pre-game, but that crush loads (80 persons per bus) would be acceptable during the half-hour post-game rush.

MUNI Metro Extension

Current plans call for the MUNI to operate the MUNI Metro Extension to Fourth and King Street as an extension of the J Line. MUNI plans to operate this service as a one-car train at the current J line headways.[29] An analysis was done assigning only ballpark patrons assumed to use the MMX at the planned service level; the result is shown in Table IV.E.32. This analysis clearly indicates that ballpark demand alone (non-ballpark users are not added) would clearly overwhelm the MMX if operated under those circumstances. Consequently, it has been assumed that added ballpark service with more cars per train and shorter headways would be operated on the MMX. The system was designed to operate four-car trains and sufficient equipment will be available to provide this level of service.[30] Sources of funding for operating four-car MMX service have not yet been identified; absent additional funds, additional ballpark service could result in some reduction in system-wide capacity on game days.

TABLE IV.E.32
BALLPARK DEMAND SUPERIMPOSED ON FUTURE MMX (ASSUMING SINGLE-CAR J LINE)

	Assumed Vehicle	Capacity 1-Car[1]	Trips (hour)	Capacity (hour)	Ballpark Demand	Demand Capacity
Weekday Day Game Post-game (3:30-4:30 p.m.) MUNI Metro Extension	1-Car Train	150	6	900	5,252	4,352
Weekday Night Game Pre-game (6:30-7:30 p.m.) MUNI Metro Extension	1-Car Train	119	6	714	4,257	3,543
Weekday Night Game Post-game (10:30-11:30 p.m.) MUNI Metro Extension	1-Car Train	150	4	600	3,002	2,402
Weekday Day Game Post-game (4:00-5:00 p.m.) MUNI Metro Extension	1-Car Train	150	4	600	3,495	2,895

Note:
1. Pre-game capacity assumes 119 passengers per car for MUNI Metro. Post-game capacities assume "crush load" capacity of 150 per car for MUNI Metro.

Source: Wilbur Smith Associates.

If four-car MMX trains were not provided, substantial increases would occur in the number of pedestrians walking from Market Street and Mission Street MUNI and regional transit lines, and pedestrian impacts described below would worsen, particularly along Second and Third Streets from Market to King Streets but also along The Embarcadero, along King Street between The Embarcadero and Second Street and along Fourth Street from Market to King Street. In addition, more fans would likely attempt to use regular bus service that provides access to the area, such as the 30, 42 and 15 Lines, and the percent of capacity used on the South of Market, southeast and northeast MUNI screenlines shown on Table IV.E.29 (p. IV.180) would increase above 65 to 88 percent with ballpark traffic. Impacts on MUNI could be similar to those described for the No Parking Variant (see Chapter VII., Variants to the Proposed Project) in that with less transit service to/from the Market Street transit lines, fans might choose to drive to the game, park in the areas south of Mariposa Street near Third Street and use the existing northbound 15 Line bus or the proposed Third Street light rail to access the ballpark. As noted in the discussion of that Variant, with less transit service, fewer people might attend some games.

Nominal capacity of a MUNI Metro car is 119, or 150 with crush loading.[31] As with the bus bridge, nominal capacities are assumed for pre-game conditions, and crush-load capacities for a half-hour post-game period. MUNI will have the equipment to operate up to four-car trains. Assuming operational flexibility, additional cars could be added to the MMX in the equivalent of a "shuttle" operation. The round-trip time between Embarcadero Station and the Second and King Streets stop and back to Embarcadero is estimated at 20 minutes; thus, cars used in this manner could provide the equivalent of three round trips per hour on the MMX, or additional shuttle capacity of 1,428 to 1,800 persons per hour per train.

While the above analysis assumed that the ballpark would be operated as a shuttle between the Embarcadero and Second Street Stations, all or some of the MMX ballpark trains could continue in service west of the Embarcadero Station. Since a large portion of the shuttle patrons would be transferring at Market Street to other modes, interlining the ballpark trains would free up capacity on other MUNI Metro trains which could then be rededicated to MMX service. With proper scheduling, the amount of net new service required to serve ballpark patrons would amount to the same for such an "interline" scenario as for a "shuttle" scenario.

Table IV.E.33 presents a summary of ballpark impacts on the proposed bus bridge and MMX service. The bus bridge is projected to require from 13 to 23 standard 40-ft. buses, depending on the time period. The critical time period for operational capacity is 3:30 - 4:30 p.m. after a weekday day game, when 23 buses would be required. This exceeds the number of buses MUNI currently uses in weekday post-game ballpark service (17), and occurs at a time of peak MUNI fleet deployment for normal weekday service. At other time periods, bus bridge requirements would be less than MUNI currently uses for ballpark service, and well within the number of undeployed vehicles in MUNI's fleet. Since average headways required to serve the projected demand would range from 0.7 minutes to 1.2

TABLE IV.E.33
SUMMARY OF BUS BRIDGE AND MMX IMPACTS

	Assumed Vehicle	Assumed Capacity[1]	Person Trips	VEH Trips Required	Vehicles Required[2]	Headways Required
Weekday Day Game Post-Game (3:30 - 4:30 p.m.)						
Bus Bridge	Standard Bus	80	3,547	45	23	0.7
MUNI Metro Extension	4-Car Train	600	5,133	9	6	3.3
Weekday Night Game Pre-Game (6:30 - 7:30 p.m.)						
Bus Bridge	Standard Bus	63	3,031	49	13	1.2
MUNI Metro Extension	4-Car Train	476	4,223	9	3	6.7
Weekday Night Game Post-Game (10:30 - 11:30 p.m.)						
Bus Bridge	Standard Bus	80	2,523	32	16	0.9
MUNI Metro Extension	4-Car Train	600	2,896	5	4	6.0
Weekend Day Game Post-Game (4:00 - 5:00 p.m.)						
Bus Bridge	Standard Bus	80	2,587	33	17	0.9
MUNI Metro Extension	4-Car Train	600	3,365	6	4	5.0

Notes:
1. Pre-game capacity assumes standard 40-ft. bus with capacity of 63 passengers per bus, and 119 passengers per car for MUNI Metro. Post-game capacities assume "crush load" capacity of 80 persons per bus, and 150 per car for MUNI Metro.
2. Pre-game conditions assume 4 round trips per bus and 3 round trips per MUNI Metro train over a one-hour period; post-game conditions assume 2 round trips per bus and 1.5 round trips per MUNI Metro train over a one-half hour period.

Source: Wilbur Smith Associates.

minutes, it would be desirable to platoon vehicles. Sending three out at a time would enable headways of 2 to approximately 3.5 minutes to be used.

For the MUNI Metro Extension, four to six trains (i.e., 16 to 24 cars) would be required depending on the time period. MUNI has stated that it will have the capability of banking six 4-car trains on King Street west of Fourth Street and with the delivery of 40 Breda cars currently on order will have sufficient fleet availability. MUNI staff also indicated that the Sixth Street Station may not be built, and that the track will initially be used to store vehicles. Headways per train required would be from 3.3 to 6.7 minutes, well within the dwell and loading time capabilities of MUNI Metro trains.

For pre-game conditions it is assumed that four-car MMX trains would be used, and that passengers would be let out on the platform side. The peak load occurs before an evening game when four-car trains arrive every six minutes. If there are 119 ballpark patrons per car or 476 patrons per train, they would all have to be accommodated at least temporarily on the platform if they are unable to cross King Street immediately. This would crowd the platform to pedestrian level of service C which would be acceptable but not desirable since trains coming in the opposite direction could further crowd the platform (see Appendix C, Table X.C.7 for pedestrian level of service definitions). Post-game conditions present a more difficult problem since there would be a large crush of patrons coming out of the ballpark wanting to get onto MUNI Metro.

The practical capacity of the new Breda light rail car is 119 persons with a crush load of 150 persons per car.[32] The crush load is appropriate to use for after-game conditions. The new Breda LRT car has much more door capacity than the current Boeing LRV and with all doors open (one side of car only), each car can be filled in less than one minute.[33] MUNI can position up to six 4-car trains west of Fourth Street; a conservative assumption is that it takes two minutes to get the next four-car train positioned after the first one departs. Thus, three-minute headways can be maintained on the line and the 15-minute capacity is: 15 minutes divided by 3 minutes per train multiplied by 4 cars per train multiplied by 150 persons per car equals 3,000 persons in 15 minutes or 200 persons per minute.[34]

The maximum MMX load occurs after a weekday game when 5,250 persons (fans plus employees) are forecast to use the MMX. Assuming that the trains can recirculate back to the ballpark and a three-minute headway can be maintained, all MMX users could be accommodated within one-half hour after the game ends. According to MUNI Planning, round-trip time for the MMX from Embarcadero Station to Fourth and King Streets and back again is 20 minutes. If all six trains which MUNI is capable of positioning were used, ten trains could serve the ballpark station within a one-half hour period, using three-minute headways (except for a five-minute gap between the sixth and seventh train).

If patrons all exit in the first 15 minutes (a "worst case" scenario) then obviously they could not fully be accommodated and would queue. The maximum queue would be 2,250 persons which would overwhelm the MUNI platform, resulting in a potential unsafe situation and queuing of patrons in crosswalk areas and portions of the street.

Non-Game Day MUNI Impacts

The project would generate about 335 p.m. peak hour transit trips on non-game days. About 60 percent of these, or 200 trips, would be on MUNI services, including approximately 100 new trips on the MMX line. This additional ridership change should have no substantial effect on MUNI operating conditions.

Regional Carriers

Table IV.E.34 presents an estimate of ballpark patronage on other transit systems in the area. (This estimate is based on the distribution and mode split factors documented in the Background Transportation Report.) Impacts on the individual carriers are described below.

TABLE IV.E.34
SUMMARY OF PEAK HOUR TRANSIT TRIPS BY REGIONAL OPERATORS TO AND FROM DOWNTOWN BALLPARK

	Transit Arrivals			Transit Departures		
Operator	Weekday Day	Weekend Day	Weekday Night	Weekday Day	Weekend Day	Weekday Night
A.C. Transit	147	56	86	159	173	142
BART - East Bay	1,558	392	880	1,681	327	1,458
BART - S.F. & South	159	86	73	170	75	121
CalTrain	2,029	1,041	674	2,190	868	1,116
Golden Gate Transit	76	12	9	82	10	14
Total[1]	3,970	1,590	1,720	4,280	1,455	2,850

Notes:
1. Columns may not add to totals due to rounding.

Source: Wilbur Smith Associates; December 1996.

BART

- Estimated peak hour ballpark patronage using BART to the East Bay ranges from 330 after a weekend day game to about 1,680 person-trips in the peak direction following a weekday afternoon game. BART considers 150 passengers per car to be a 'practical maximum' (although crush loading following events may actually go higher). Based on BART's 'practical maximum' criterion, the additional demand for capacity in the peak direction of ballpark patron travel would range from the equivalent of 2.2 to 11.2 BART cars for any given pre-game or post-game period. During the period of maximum demand (post-weekday afternoon game) BART currently operates on five-minute headways, or 12 trains per hour in each direction. BART has the capacity and equipment to add more cars to existing trains and to add one or more trains during this time period.

The forecast period of maximum BART demand would be after a weekday afternoon game, in the 3:30 to 4:30 time period. Since BART does not serve the ballpark directly and would be accessed by the bus bridge, MMX or other modes, it is likely that BART demand would spread throughout at least a half-hour period.

According to BART staff,[36] the three transbay lines have sufficient excess capacity to accommodate the 1,800 fans projected to use BART to the East Bay following a weekday afternoon game assuming most BART travel occurred at around 4:00 p.m. or earlier. In addition, BART schedules for service from San Francisco to the East Bay include two unoccupied "slots" in each 15-minute time period prior to 4:30. Eight 7- to 10-car trains are stored at the Colma yard and are inserted into vacant slots over a 90-minute period under normal conditions after 4:30. If ballpark demand warranted, one or more of these trains would be sent out early to provide additional capacity to the East Bay, provided they could return to Colma in time for the last normally scheduled "slot" assignments.

Mitigation would involve coordination with BART to assure that trains of adequate capacity would be available to pass through the Downtown stations at an appropriate interval after the ends of games.

CalTrain

Before and after all ballgames, CalTrain would need to add cars to existing trains in order to accommodate the added demand from the ballpark.[37] CalTrain would need to add a new ten-car train following a weekday night game, when as many as 1,120 patrons would want to use the Peninsula commute service. CalTrain's last scheduled southbound train leaves the Fourth and Townsend Depot at 10:00 p.m., well before the time that most weekday night games would end. It is not assumed that CalTrain would adopt the practice of holding its last train on game nights until the completion of the game, as it currently does for San Jose Sharks' hockey and Golden State Warriors basketball games. Rather, it is assumed that an additional train would be provided and held until the end of the game.[38]

Table IV.E.35 indicates the expected impact on existing CalTrain service for weekdays and weekends where current service can be made to work for ballgames. The maximum train length generally is ten cars, and CalTrain runs trains of ten cars for special events such as

TABLE IV.E.35
IMPACTS ON CALTRAIN RAIL SERVICE

Cal-Train #	4th & Townsend Departure	No. of Seats (Cars)	Maximum Load Point	Maximum Load Factor	Project Added Ridership	Existing + Project Load Factor	Additional Cars Required
Weekday Afternoon Game (3:30 - 4:30 p.m.)							
52	3:45 p.m.	700 (5)	California St. (Palo Alto)	49%	750	165%	3
54	4:25 p.m.	560 (4)	22nd St.	71%	750	210%	5
56	4:30 p.m.	560 (4)	South S.F.	33%	750	172%	3
Weekend Day Game (4:00 - 5:00 p.m.)							
152	4:00 p.m.	560 (4)	4th & Townsend	32%	300	83%	0
160	5:00 p.m.	700 (5)		32%	615	116%	2

Source: SamTrans/JPB Darton Ito, February 1996 data. Wilbur Smith Associates; September 1996

football games from time to time. Table IV.E.35 indicates that three to five additional cars would need to be added to the early rush-hour trains; these cars are or will be available after currently ordered vehicles are delivered. The required added capacity would be far less on weekends where an additional two cars would be needed and many vehicles are available.

- CalTrain ridership has registered annual increases of at least five percent in recent years, and has increased 7.4 percent in the first three months of 1997. Much of this growth has been in the reverse commute, San Francisco to Peninsula market. Continued ridership growth may conflict with CalTrain's ability to provide capacity for ballpark fans. This would be particularly true for weekday afternoon games. During the weekday afternoon time period the availability of parking at Peninsula stations for ballpark fans would also be very limited.

Golden Gate Transit

- Impacts of the project on Golden Gate Transit are projected to range from nine patrons arriving on GGT for a weekday night game to 82 persons departing after a weekday day game. The greatest impacts on available capacity would be 76 patrons arriving for weekday afternoon games at a time when they would be loaded on ten one-way bus trips, or 7.6 patrons per trip, and 14 passengers departing a weekday night game, who would be loaded

onto two bus trips, or 7 passengers per bus. These runs currently average 14 and 13 patrons per bus, and with the added trips would still be within the capacities of 39 to 45 passengers per bus. These fans could then reach the ballpark by transferring to MUNI Lines 15 or 42, or walking two blocks to the bus bridge stop on Second Street near Market Street. The 82 persons departing after a weekday game would be loaded onto 102 basic and commute trips, or less than one person per bus.

AC Transit

Discussions with AC Transit staff indicate that the carrier has no current plans to serve the ballpark directly, although AC Transit might run a charter for night games if there were demand for such a service.[39] It is likely that some East Bay fans would use AC Transit to the Transbay Terminal and access the ballpark via the 42 or 15 bus lines. The proportion of total transbay transit riders (persons on either BART or AC Transit) currently using AC Transit (10 percent of total) was assumed in apportioning ballpark trips.

SamTrans

Currently SamTrans does not intend to have direct bus service to the ballpark, but would rely on CalTrain service.[40] While it is possible that some persons would ride SamTrans to the Transbay Terminal and then transfer to MUNI, this number would be very small and has not been considered in the calculations.

Amtrak

The ballpark's impact on Amtrak service is estimated to be negligible, with at most ten pre-game passengers arriving on Amtrak.

Cumulative Regional Transit

Cumulative growth by the year 2015 would add approximately 350 passengers to BART, 150 to CalTrain and 100 to Golden Gate Transit beyond that estimated for the existing setting

plus project. This equates to two CalTrain cars, two BART cars, and two Golden Gate Transit coaches in addition to the requirements identified above for the project.

Charter Bus and Taxi

Table IV.E.36 lists the numbers of ballpark patrons projected to use modes of arrival and departure other than automobile and scheduled transit services within one hour of the beginning or end of a game. These modes include charter bus, walk, bike and taxi. Impacts of pedestrians and bicyclists are discussed on pp. IV.215 - IV.224. Charter bus and taxi modes are discussed below.

Charter Bus

Based on an average vehicle occupancy of 35 passengers, the following number of charter buses are forecast for sellout games:

Weekday afternoon:	21
Weekday night:	21
Weekend day:	28

There is sufficient space in the main parking lot south of the China Basin Channel to accommodate these vehicles and it is assumed that they would load and unload in the parking lot. (This is advisable since it is important that passengers know where to go after the game to return to their bus.) Passengers would then walk to the ballpark via the Lefty O'Doul Bridge. Charter buses would access the parking lot in a similar manner as automobiles via Third Street from the south and Fourth Street from the north. The lack of any special priority treatments for buses on the routes the charter buses would use (due to the limited number of bridges that cross the Channel) could result in a somewhat diminished effectiveness of charter buses compared to the current operation at 3Com Park where such priorities are now provided on Ingerson Avenue.

TABLE IV.E.36
SUMMARY OF PEAK HOUR TRIPS BY OTHER MODES TO AND FROM DOWNTOWN BALLPARK

Modes	Arrivals			Departures		
	Weekday Day	Weekend Day	Weekday Night	Weekday Day	Weekend Day	Weekday Night
Charter Bus	681	977	748	761	958	746
Walk	4,883	2,564	4,935	4,097	4,281	801
Bike	167	317	0	190	288	0
Taxi	375	202	413	308	290	137
Total[1]	6,105	4,060	6,095	5,355	5,815	1,685

Note:
1. Columns may not add to totals due to rounding.

Source: Wilbur Smith Associates.

Taxi

Up to about 415 persons are estimated to arrive at the ballpark by taxi for a weekday night game. Assuming an occupancy of 2.5 passengers, approximately 165 taxi trips would be needed. If distributed throughout the hour, this would create a demand for 55 taxis, assuming a 20-minute round trip between downtown origin/destination locations and the ballpark. San Francisco currently has 861 taxi medallions issued; most if not all of these taxis are on the street during periods of highest demand. The peak ballpark demand for 55 taxis (approximately 6 percent of the total fleet) would occur during a period of overall high taxi demand, and place additional demands on what is currently perceived as a scarce resource.

PROJECT PARKING IMPACTS

Parking impacts are analyzed for existing-plus-project conditions. The analysis considers parking supplied by the project, total project parking demand, available parking supply, and the project's parking surplus or shortfall for weekday midday, weekday evening, and weekend midday conditions. The parking short falls and surplus analysis results would be similar for a non-baseball event of a similar size.

The project would provide about 5,000 dedicated parking spaces for ballpark fans, game day employees, and concessionaires, within a 15-minute walk distance of the ballpark. Parking dedicated to the ballpark would be located on property south of China Basin Channel on the east and west sides of Third Street. This property is owned by the Port of San Francisco and Catellus Development Corporation. The lots would be used for an interim period, partly to measure the level of demand for parking based on actual use of the parking facilities. Permanent parking would be developed within the same general location, if necessary, as part of re-planning the South of China Basin Channel area.

In addition to dedicated ballpark parking in the South of China Basin Channel area, approximately 210 parking spaces would be provided within the ballpark site for the team, Giants' administrative staff, and employees of the year-round restaurant, broadcast studio, and Pacific Bell Learning and Communications Center and the other uses in the Pavilion Building. These include 180 spaces for the ballpark and 25 to 30 spaces for the Pavilion Building. These ancillary uses would create a demand for 210 parking spaces on non-game and game-day weekdays. In addition, game-day employees and concessionaires would create a demand for approximately 270 spaces.

The City Planning Code (Section 151) parking space requirement for a stadium facility calls for one on-site space for every 15 seats. The Planning Code parking requirement for a 42,000-seat ballpark would be 2,500 on-site spaces. Pursuant to Proposition B, the project would not be required to meet City Planning Code parking requirements. Proposition B

establishes no minimum parking requirement, in recognition of the availability of about 5,000 spaces near the ballpark site, and the accessibility of the site to transit.

Project Parking Demand

Based on trip generation and mode split analyses (previously discussed, pp. IV.88 - IV.100) for sellout games, the project would generate demand for a total of about 8,530 parking spaces during weekday games, 10,590 spaces during weekday evening games, and 10,905 spaces during weekend games (see Appendix C, Table IX.C.11, p. A.126). Employees in the ballpark and Pavilion Building and concessionaires for the ballpark would use about 425 to 475 of these spaces. The proposed project would provide a total of 5,210 dedicated parking spaces and, therefore, not all of the project's parking demand could be satisfied by the dedicated ballpark parking. Fans who could not find parking in the dedicated lots would seek available on- and off-street parking elsewhere within the study area (within a 15-minute walk distance or beyond).[41] Within the study area, the nearest supply of off-street parking is located north of the China Basin Channel.

Parking Availability/Supply

Existing parking inventory and utilization within a 15-minute walk distance of the ballpark are described in III.E. Transportation and Circulation, pp. III.95 - III.99.[42] That analysis indicates there are an estimated 2,570 total parking spaces (on-street and off-street in public and private lots) which are available (not occupied) on weekdays, about 8,430 spaces available on weekday evenings, and about 6,565 total spaces available on weekends.[43] However, the total number of available parking spaces would be reduced due to the removal of existing parking on the project site. It is also unlikely that all of the unoccupied spaces would be available at all times due to restricted use of private employee and customer parking and due to planned development which would displace existing surface parking lots.

To account for these factors, parking availability in the study areas was adjusted for existing-plus-project (year 2000) conditions, as discussed below.

Displacement of Parking from the Project Site

Construction of the ballpark would displace an existing 300-space parking lot from the project site. During weekday afternoons, approximately 270 of these spaces are occupied, and would no longer be available after project construction. These 270 parkers would need to find parking elsewhere, mostly likely in the study area. Therefore, the available supply of parking on weekday afternoons has been reduced by 270 spaces to account for parkers who would be displaced from the project site. It is also assumed that these parkers would seek spaces in other off-street public parking lots at the nearest available location. The approximately 30 unoccupied spaces on the project site have not been included in the inventory to account for development on the site.

On weekday evenings and weekend afternoons, parking on the project site is used infrequently. Therefore, parking displacement is expected to be minimal for these periods and is not included in the analysis of weekday evening and weekday afternoon conditions.

Restricted Use of Private Parking

The parking inventory of the study area indicated that there is a total of about 3,055 off-street private spaces. This private off-street parking is currently used by customers and employees of businesses and therefore would not necessarily be available to Giants' patrons. While there would be a financial incentive to make unused customer and employee parking available to ballpark patrons, private businesses would weigh this decision against their own customer and employee parking needs, parking liability risks, and business access concerns.

For purposes of analysis, a conservative assumption was made that private parking would be made available only during evenings and weekends, due to the need for customer and employee parking during normal, weekday work hours. Without an actual survey and commitment from business and property owners, the number of private parking spaces that would be made available to Giants' patrons cannot be precisely determined. Therefore, in consultation with Planning Department staff, potential availability of private off-street parking was estimated based on a combination of the following major factors:[44]

- **Access/Visibility:** Lots which are located on, and visible from, major access streets to the ballpark were assumed to provide greater potential for ballpark parking than lots which do not have good access, visibility and proximity to the ballpark site.

- **Type of Business:** Businesses with high parking turnover and high customer or employee parking demand during evening or Saturday hours (e.g., restaurants, banks open on Saturdays, and retail establishments such as Office Depot, the California Flower Market, and the San Francisco Tennis Club) were considered unavailable.

- **Size of Parking Lots:** Except in the immediate vicinity of the ballpark, lots which could provide 50+ spaces (marked or valet) were assumed to have better potential to provide ballpark parking, as these lots would be more likely to have layouts for efficient maneuvering of cars and ingress/egress to handle fan parking. Smaller lots within about three blocks of the ballpark that were visible and accessible from major streets were also included as these lots would provide convenient nearby parking for Giants fans.

Based on this analysis, roughly 35 percent or about 1,100 of the total 3,055 private off-street parking spaces would be available for ballpark parking within the study area on weekday evenings and weekends, under both existing-plus-project and cumulative (year 2015) conditions. The 1,100 spaces were derived by conducting a block-by-block review of private parking lots in the study area. As described above, private lots that had the greatest potential to provide ballpark parking were selected based on the type of business operation associated with the lot; the location and visibility of the lot from major access streets to the ballpark; and lots with 50 or more spaces, except for lots within about three blocks of the ballpark site. See Appendix E of the Transportation Background Report for a list of the private parking lots assumed to be available to Giants fans.

Removal of Parking Due to Currently Planned and Future Development

Approximately 55 percent of the off-street parking within (up to 10-minute walk) and adjacent to (a 15- to 20-minute walk) the study area is located on surface lots. Some of this parking would be removed due to planned new freeway and transportation improvements associated with the replacement of the Mid-Embarcadero and Terminal Separator freeway structures, and due to proposed development in the Rincon Point and South Beach neighborhoods. Off-street, public parking that would be removed as a result of currently planned development is summarized in Table IV.E.37 for the year 2000. (See Appendix C, Transportation and Circulation, Table X.C.12, p. A.127, for a block-by-block description of parking spaces that would be removed due to current development.)

Parking Surplus/Shortfall

Existing-plus-Project

Weekday Midday Games

During weekday afternoon games, there would not be sufficient parking available within a 15-minute walk to handle overflow parking from the ballpark. There could be a shortfall of approximately 2,580 spaces within the parking study area, assuming a sellout crowd (see Table IV.E.38, p. IV. 207). This analysis accounts for the loss of 270 occupied spaces in the project site, and approximately 350 public, off-street spaces that would be removed due to construction of transportation improvements and planned development within the study area expected to be completed by 2000.[45,46]

- On weekdays, overflow parking potentially could be accommodated by unoccupied parking outside of the study area, beyond a 15-minute walk distance from the ballpark. Most of the

TABLE IV.E.37
ADJUSTED PARKING INVENTORY

		Existing-Plus-Project Conditions (Year 2000)		Cumulative (Year 2015) Conditions	
Walk Time	Total Public Spaces[1]	Spaces Removed	Adjusted Inventory	Spaces Removed	2015 Inventory
Within Study Area - 0-15 Minutes Walk[2]	6,185	(350)	5,835	(375)	5,460
Adjacent to Study Area - 15-20+ Minutes Walk[3]	9,765	(1,525)	8,240	(2,170)	6,070

Notes:
1. Available parking spaces does not include project-supplied, dedicated parking.
2. Parking within the study area is defined as those spaces within a 15-minute walk distance from the ballpark site north of China Basin Channel. Parking that would be removed adjacent to the study area includes lots owned by Caltrans north of Folsom Street, between Second and Spear Streets.
3. Parking adjacent to the study area is defined as those spaces outside of the study area, within a walk distance from the ballpark site of from 15 minutes to slightly over 20 minutes (20+).

Source: Pittman & Hames Associates.

available parking lots would be located north of Folsom Street, between the area bound by Mission Street, Sixth Street and The Embarcadero. On weekdays, an estimated 3,080 public off-street parking spaces could be available within a 15 to 20+ minute walk distance and would exceed the ballpark parking demand deficit of 2,580 spaces. It is also reasonable to assume that some private parking would be made available outside of the study area to Giants fans. Generally, parking conditions outside of the study area south of Mission Street would be constrained as Giants fans could fill approximately 85 percent of the available (unoccupied) parking spaces.

TABLE IV.E.38 ●
EXISTING + PROJECT PARKING SURPLUS/(SHORTFALL)
YEAR 2000

	Weekday Afternoon[2]	Weekday Evening			Weekend Afternoon		
	Off-Street	On-Street	Off-Street		On-Street	Off-Street	
Walk Time[1]	Public[3,4]	Public	Public[3]	Private[5]	Public	Public[3]	Private[5]
Available (Unoccupied) Spaces Within Study Area[6]							
0-5 Minutes	0	191	119	315	15	168	315
5-10 Minutes	0	462	1,117	245	160	1,065	245
10-15 Minutes	738	946	3,134	540	546	2,867	540
Subtotal	738	1,599	4,370	1,100	721	4,100	1,100
Parking Supply							
Total Unoccupied On- and Off- Street Spaces	740		7,070			5,920	
Total Dedicated Ballpark Spaces	5,210		5,210			5,210	
Total Parking Supply	5,950		12,280			11,130	
Total Parking Demand	8,530		10,590			10,905	
Surplus/(Shortfall)	(2,580)		1,690			225	

Notes:

1. Measured from project site.
2. Assumes that no public on-street parking is available for Giants parking during weekday afternoons.
3. Available public parking accounts for reduction of approximately 350 total public, off-street spaces that would be removed from existing surface lots due to development and construction of transportation improvements. Varying numbers of these spaces would have been available, depending on the time of day and the occupancy of various lots, but have been subtracted from the supply due to assumed development (see text endnotes 45 and 46).
4. Available parking on weekday afternoons accounts for 270 parkers who would be displaced from the project site due to construction of the ballpark. The analysis also assumes that these displaced parkers would seek parking elsewhere in the study area at the nearest available location. Because parking on the project site is used infrequently during the weekday evenings and weekend afternoons, the parking supply has not been reduced to account for displaced parkers during these time periods.
5. Available private parking includes approximately 1,100 private, off-street employee and customer parking spaces that would be made available to Giants fans on weekday evenings and weekends. No private parking would be available on weekdays due to demand for parking by customers and employees, and the increased potential for parking and business access conflicts with Giants fans.
6. Available parking spaces does not include project supplied, dedicated parking. Available spaces includes unoccupied spaces within the project study area as defined by a 15-minute walk distance from the ballpark site.

Source: Pittman & Hames Associates, Wilbur Smith Associates.

Overflow parking could also occur beyond the dedicated ballpark parking lots located south of China Basin Channel. Within a 15- to 20-minute walk distance south of the channel (to approximately Sixteenth Street), there are no formally designated public parking lots. Much of the land uses in the area are industrial or vacant. Off-street parking is mostly informal and occurs in unmarked lots or undesignated parking areas. Unless formal parking lots are developed, overflow parking could occur illegally on underused or vacant parcels, as well as encroach onto residential streets on Potrero Hill.

Weekday Night Games

During weekday evening games, sufficient parking would be available within the study area to meet overflow parking demand. Overflow parking conditions could occur about 42 times a year, assuming a sellout crowd for all night games. Approximately 7,070 spaces would be available and would exceed the 5,380 spaces which could not be accommodated by the 5,210 dedicated ballpark parking spaces. The 7,070 available spaces includes about 1,600 on-street spaces, 4,370 off-street public spaces, and 1,100 private off-street spaces, leaving a parking surplus of about 1,690 spaces (see Table IV.E.38).

Weekend Afternoon Games

During weekend afternoon games, there would be a small parking surplus of about 225 spaces, assuming sellout crowds. However, parking essentially would be at capacity on Saturday afternoons as Giants fans could fill over 95 percent of the 5,920 unoccupied parking spaces within the study area.[47] Under these conditions the ability to find parking would be constrained. Many fans would be forced to search for parking outside of the study area. These conditions would occur approximately 26 times a year, assuming sellout crowds on Saturday. On Sunday afternoons parking is more available in the North of Channel area. On weekend afternoons, approximately 4,670 public off-street spaces would be available

outside of the parking study area including spaces in the 2,644-space City-owned garage at Fifth and Mission Streets. This number of spaces would be adequate to handle overflow parking demand that could not be accommodated in the study area.

Cumulative Parking Impacts

By the year 2015, the available supply of public, off-street parking would be further reduced, as a result of development on surface parking lots within the study area, particularly along the Folsom Street corridor where there are several large parcels of underutilized land.[48] (See Table IV.E.37, p. IV.206, cumulative columns.) Approximately 375 public, off-street spaces would be removed; these spaces would be in addition to the 350 spaces removed under existing-plus-project year 2000 conditions.[49]

Weekday Afternoon Games

As shown in Table IV.E.39 under cumulative (2015) project conditions, there would be a parking shortfall of about 2,580 spaces during weekday afternoon games, assuming sellout crowds. On these days, there would not be sufficient parking within the study area to handle overflow parking from the ballpark's dedicated parking lots. This shortfall could be accommodated outside of the study area, within a 15 to 20+ minute walk distance. After accounting for existing parking that would be removed due to future development, there would be an estimated 2,585 unoccupied spaces outside of the study area, located in the area generally bound by Folsom, Mission and Sixth Streets, and The Embarcadero. Therefore, the parking shortfall of 2,650 spaces would result in full use of available parking outside of the study area. Parking conditions would be quite constrained within the study area and outside of the study area south of Mission Street.

TABLE IV.E.39 ●
CUMULATIVE + PROJECT PARKING SURPLUS/(SHORTFALL)
YEAR 2015

Walk Time[1]	Weekday Afternoon[2]	Weekday Evening			Weekend Afternoon		
	Off-Street	On-Street	Off-Street		On-Street	Off-Street	
	Public[3,4]	Public	Public[3]	Private[5]	Public	Public[3]	Private[5]
Available (Unoccupied) Spaces Within Study Area[6]							
0-5 Minutes	0	191	119	315	15	168	315
5-10 Minutes	0	462	1,117	245	160	1,065	245
10-15 Minutes	669	946	2,856[7]	540	546	2,612[7]	540
Subtotal	669	1,599	4,092	1,100	721	3,845	1,100
Parking Supply							
Total Unoccupied On- and Off-Street Spaces	670		6,790			5,665	
Total Dedicated Ballpark Spaces	5,210		5,210			5,210	
Total Parking Supply	5,880		12,000			10,875	
Total Parking Demand	8,530		10,590			10,905	
Surplus/(Shortfall)	(2,650)		1,410			(30)	

Notes:

1. Measured from project site.
2. Assumes that no public on-street parking is available for Giants parking during weekday afternoons.
3. Available public parking accounts for reduction of approximately 350 total public, off-street spaces that would be removed from existing surface lots due to development and construction of transportation improvements (see text endnotes 45 and 46 for more explanation).
4. Available parking on weekday afternoons accounts for 270 parkers who would be displaced from the project site due to construction of the ballpark. The analysis also assumes that these displaced parkers would seek parking elsewhere in the study area at the nearest available location. Because parking on the project site is used infrequently during weekday evenings and weekend afternoons, the parking supply has not been reduced to account for displaced parkers during these time periods.
5. Available private parking includes approximately 1,100 private, off-street employee and customer parking spaces that would be made available to Giants fans on weekday evenings and weekends. No private parking would be available on weekdays due to demand for parking by customers and employees, and the increased potential for parking and business access conflicts with Giants fans.
6. Available parking spaces under cumulative conditions does not take into consideration any demand generated by the Transbay Area Redevelopment Plan or other potential future development in the vicinity of the proposed ballpark which, understandably, is unpredictable at this time.
7. The supply of public parking spaces within the 10- to 15-minute walk distance would be decreased from existing-plus-project conditions (Year 2000) due to parking removed from existing surface lots in 2015 (see also note #3 above). This is the only change in supply assumed for the cumulative (Year 2015), as compared to existing-plus-project conditions (see Table IV.E.38).

Source: Pittman & Hames Associates, Wilbur Smith Associates.

Weekday Evening Games

Overflow parking from the ballpark dedicated parking lots would be fully satisfied by available, unoccupied parking spaces within the study area. However, with soldout games, parking outside of the study area would be at 92 percent of capacity, which is essentially fully occupied. Approximately 6,790 spaces would be available as compared to the ballpark's total unmet parking demand of 5,380 spaces (see Table IV.E.39). There would be a parking surplus of 1,410 spaces still available within the study area, after accounting for overflow parking demand from the ballpark.

Weekend Afternoon Games

During soldout Saturday afternoon games, overflow parking demand from the ballpark would use all remaining parking capacity within the study area. There would be a deficit of about 30 spaces that would need to be accommodated outside of the study area. Overflow demand for weekend games would occur about 26 times a year, assuming a sellout crowd. Approximately 5,665 spaces would be available as compared to the 5,695 spaces which could not be handled by the dedicated ballpark parking (see Table IV.E.39). Essentially, parking facilities would be at capacity and fans and existing downtown residents and business patrons would be forced to seek parking outside of the study area. After accounting for parking that would be lost due to future development and transportation improvements, an estimated 3,570 parking spaces would be available outside of the study area, within a 15 to 20+ minute walk distance. This number of spaces should be adequate to handle overflow parking demand that could not be accommodated within the study area. However, on weekend game days, particularly Saturday, parking supply South of Market could be further constrained when other popular events (e.g., a weekend exhibit at the Moscone Center or Museum of Modern Art) are held. Overflow parking could be expected to occur in the South Beach neighborhoods and areas north of Market Street. Residents, visitors and ballpark patrons

may be required to extend their search times or to park farther from their destination during game days.

Cumulative Impacts of UCSF/Mission Bay 2015 Cumulative Scenario

A 5,000-space parking structure that would provide parking for the Giants is assumed to have been built on property owned by Catellus Development Corporation or the Port of San Francisco in the Mission Bay Planning area. The site is expected to be located in the area south of the Channel along Third Street. As a result the cumulative impacts of the ballpark under the UCSF/Mission Bay year 2015 scenario would not be any different than the cumulative 2015 scenario impacts presented above. The land uses proposed south of the China Basin Channel include office, research/light industrial and the UCSF campus. Currently, the concept land use plan calls for these uses to provide one parking space for every 1,000 sq. ft. of floor area; this represents 5,000 spaces for the commercial/light industrial land uses. The *UCSF Long Range Development Plan EIR* identifies a parking demand of 4,198 spaces and indicates that 4,200 spaces would be provided on the UCSF campus to meet this demand. The employment orientation of the combined UCSF and Mission Bay commercial/light-industrial-related parking suggests that during weekday afternoon games, this parking would likely be at a high level of occupancy. Ballpark fans may attempt to utilize any of this parking that is both close to the ballpark and available to the public. On weekday evenings and weekend days, more substantial amounts of this parking would be potentially available, assuming that UCSF and the operators of the other commercial parking in the area keep the parking open and available to ballpark fans.

South Beach Harbor Marina Parking

As discussed on p. III.29, the San Francisco Redevelopment Agency (SFRA) is considering reconfiguring and extending the South Beach Park and parking area, placing 210-250 parking spaces under an earthen berm (i.e., the park). The SFRA is currently in the process of

designing the parking to share the Second Street entrance with the ballpark project's internal parking facility. The joint entrance would allow an increase in the number of parking spaces to be provided for the Marina. The Second Street entrance and access road would serve the 180 parking spaces for the ballpark and the loading dock area located under the centerfield bleachers.

If parking for the Marina is provided adjacent to the ballpark's internal parking facility, the current system of permit parking used adjacent to the Marina could be implemented to strictly reserve parking for Marina users during ballgames. During ballgames, the Marina parking would need to be protected to prevent use by ballpark fans who would seek convenient, low cost parking.

Personnel could be stationed at the garage entrance, before and during games, at the King Street driveway entrance to the access road to the Marina and Giants parking areas if parking access were to be limited.

As stated on p. V.16, preliminary traffic routing plans before and after baseball games call for the closure of King Street between Second and Third Streets. The intersection of Second and King Streets would remain open under the control of parking control officers (PCOs). Access to the South Beach Harbor and the ballpark parking area would be possible via either Second Street or The Embarcadero/King Street. It is likely that people using the Marina parking area when entering or departing the garage would experience delays and inconvenience, as there would be traffic congestion on both The Embarcadero and Second Street.

- South of Channel Parking

Terry A. Francois Boulevard provides access and on-street parking for a number of businesses and waterfront recreational uses. As currently proposed, Terry A. Francois

Boulevard would be one of the access streets to the 5,000-space dedicated parking area. Use of Terry Francois would reduce the amount of ballpark traffic using Third Street between Mariposa Street and the Lefty O'Doul bridge.

During ballgames it is likely that some ballpark patrons would take advantage of nearby free parking along Terry A. Francois Boulevard. The result would be that non-ballpark users of the waterfront area would have difficulty finding parking during this time period. Several measures which could minimize parking difficulties on maritime and recreational uses east of Terry Francois Boulevard are noted in Other Mitigation Issues, p. V.45, and in transportation mitigation measures discussed on p. V.34.

- Parking Impacts on South Beach Residents

The South Beach area is clearly within the 15-minute walking distance zone from the ballpark, and ballpark patrons would be expected to compete for any available parking in the South Beach area.

The following discussion identifies potential effects of the ballpark in the South Beach area based on a limited number (294, or 17 percent) of responses to the South Beach residential parking survey. As such, this discussion cannot be considered a conclusive analysis of the project's impacts on residential parking in the South Beach area. A detailed description of the survey responses is presented in Appendix E of the Background Transportation Report.

South Beach residents who rely upon on-street parking (about 30 percent of the survey respondents) would be the most directly affected by overflow parking conditions from the ballpark.[50] Overflow parking from the ballpark would be the greatest during weekday afternoon games, which is a non-peak period for residential parking demand (see discussion in the following paragraph). Each of the developments provides some amount of on-site parking for residents. Two of the developments provide one parking space per unit, but the remaining three developments provide an average of about 0.9 space per unit. Most residents are required to pay for their parking. Residents who pay for parking in privately operated public lots (roughly four percent of the respondents) could be affected if lot owners decide to charge higher rates or reserve existing spaces for fan parking on game days.

According to the survey, peak residential parking demand (including residents and their guests and visitors) occurs between 6:00 p.m. and 9:00 p.m. on weekdays. This demand would coincide with ballpark parking demand during weekday night games. These conditions would occur 42 times a year from April through September. During weekday evening games, there would be adequate parking, including both off-street and on-street, to accommodate overflow parking from the ballpark. South Beach residents, however, would mostly compete with fans for available on-street spaces. During weekday afternoon games, residential demand between 3:00 and 6:00 p.m. would overlap with ballpark fans departing

from weekday games. Weekend parking needs appear to be fairly high and constant throughout the entire weekend day and evening periods. During Saturday afternoon games, South Beach residents would compete with Giants fans for a limited number of on-street parking spaces.

Overall, South Beach residents who rely upon on-street parking (about 30 percent of the survey respondents) would compete with Giants fans for available on-street parking spaces in the study area on game days.

Parking Impacts on Potrero Hill Residents

The Potrero Hill area (including Dogpatch) is within the 25 to 30 minute walk distance of the ballpark site. It is inevitable that a few ballpark patrons would attempt to park in the Potrero Hill neighborhood, although most would be deterred by the availability of closer parking than the longer walk back to their car after events. Since the South Bay, including the Peninsula, would have the highest percentage of non-San Francisco trip origins to the ballpark, it is also plausible that some of these people would elect to exit I-280 at the northbound I-280/ Pennsylvania Street off-ramp, and seek parking in the Potrero Hill area. However, the *majority* of ballpark patrons would seek closer parking in the dedicated ballpark parking lots, within a 15 minute walk distance.

While Potrero Hill residents would experience the inconvenience of some cars circulating within their neighborhood to seek "free" parking, the number of fans doing so would be a small portion relative to the total number of stadium parkers. There are a number of approaches to minimize overflow parking impacts on Potrero Hill residents; see the discussion of Other Mitigation Issues, beginning on p. V.45. Potrero Hill residents would be more likely to be affected by overflow parking from the ballpark if dedicated parking were not provided south of China Basin Channel. This possibility and its impacts are discussed in Chapter VII. Variants to the Proposed Project, pp. VII.9 - VII.16.

Parking Improvement Measures

Parking shortfalls are not considered a significant environmental impact because they do not produce any measurable physical effects, although they are inconvenient for many drivers and sometimes cause drivers to switch to transit or carpool modes. Providing additional parking to reduce shortfalls would not be consistent with the City's "transit first" policies. The *Transportation Element* of the *San Francisco General Plan* encourages enhancement of San Francisco's position as a regional destination, but without encouraging use of the automobile for access (Objective 3), and encourages development of marketing strategies to promote transit for recreational, cultural and other non-work trips to and within the City (Objective 13).

The project sponsor could undertake activities that would help to limit parking shortfalls without developing additional parking facilities, as discussed below.

- Project sponsor could secure contractual commitments from private businesses and property owners to guarantee that a specified number of parking spaces would be available to Giants fans on weekends, particularly on Saturdays, within the study area north of China Basin Channel. This would result in a better distribution of parking north and south of the Channel, which would improve the distribution of traffic. It would also serve to reduce the size of the area which is impacted by fans parking for weekend ballgames.
- Project sponsor could secure commitments from public and private garages within the study area that are currently closed on weekends and evenings to remain open on game days.

- Project sponsor could develop and implement a parking monitoring program during the initial five years of operation. The parking monitoring program would be designed to determine the total parking demand generated by the ballpark based on actual use of the ballpark parking, including overflow parking north and south of China Basin Channel. The purpose of the program would be to adjust the amount of dedicated parking spaces provided by the project to ensure adequate parking, minimize overflow parking conditions, and develop a long-term plan for permanent parking. The parking monitoring results should be submitted to the San Francisco Planning Department for review at the end of each baseball season, so that adjustments can be made each year to improve the parking supply, parking operations, and educational/marketing programs for the following season.

- The South Beach and Potrero Hill areas should be monitored for parking intrusion during ballgames. Pursuant to Ordinance 312-76, the South Beach and Potrero Hill neighborhoods could initiate the implementation of a permit parking program in their respective neighborhoods. In developing the program, the Department of Parking and Traffic (DPT) should provide technical assistance to the neighborhoods to identify and address parking issues which are uniquely associated with the ballpark during the baseball season and periodic special events. These issues include the boundary locations; the location of different parking time limits within the permit area boundaries; parking time limits during game and non-game seasons; and a coordinated signage program. The technical assistance would also determine the feasibility of residential visitor passes on game days. Much of this information could be developed by DPT for the parking and traffic study required as part of the permit parking program procedures. In addition, DPT would need to address the feasibility of issuing a limited number of permits in the South Beach area, because the number of residential units exceeds the supply of on-street parking available in this area.

- Project sponsor could coordinate with the facility or parking managers of major activity centers in the South of Market area (e.g., MOMA, the Moscone Center, and the Fashion Center) to avoid simultaneous scheduling of major events when possible, and to provide additional parking supply when simultaneous events do occur.

- The project sponsor could explore the possibility of negotiating with parking garages north of Market Street which are closed or underused on weekends and week nights to provide satellite parking for Giants fans with a shuttle to and from the ballpark. Parking facilities should be targeted to existing facilities North of Market Street, as well as outlying locations. Identified facilities in the downtown should be clustered together within several blocks, so that shuttle buses could pick up fans from several parking facilities at a centralized location.

PEDESTRIANS AND BICYCLES

Pedestrian Impacts

Pedestrians would access the site from the east via The Embarcadero, from the north via Second, Third and Fourth Streets, from the south via Third Street, and from the west via

Townsend Street, King Street and Berry Street. South of the China Basin Channel, there is no through east-west connection between Seventh and Third Streets until Sixteenth Street.

When King Street terminates at Fifth Street (and the new I-280 ramps), there will be no continuous through east-west connection between Townsend Street and Sixteenth Street with the exception of Berry Street. Nearly one mile separates Townsend and Sixteenth Streets, and the lack of east-west connections in this area would be an inconvenience for pedestrians. These streets alone are not sufficient for east-west pedestrian and bicycle circulation to and from the ballpark.

Future pedestrian volumes and assignments were developed for the study area using the person-trip forecasts developed in the Background Transportation Report (Chapter 3). The pedestrian forecasts include all fans regardless of primary travel mode, as virtually all ballpark fans would be pedestrians for the last few blocks of their trip to and from the ballpark. To determine the peak hour pedestrian volumes, the number of person-trips by mode is multiplied by the peak hour factor. To summarize briefly, all fans who take transit, walk or bike to the site were assumed to leave within the first hour after the game. For those in private autos, 72 to 82 percent are assumed to leave within the first hour after the game (depending on the time and day of the game). The remainder either leave during the game or within the second hour after the game ends.

Person-trips were assigned to routes based on their primary travel mode. For example, all fans who drove to the ballpark were assigned to various paths in proportion to the parking space availability. It was assumed that the approximately 5,000 dedicated spaces south of China Basin Channel would be fully occupied. Using the assumed average auto occupancy rates, over 13,000 pedestrians would be walking to and from these parking lots over the Lefty O'Doul and Peter Maloney Bridges. Fans arriving by charter bus would walk to the site from the charter bus staging area, south of the Channel and would also walk over the Lefty O'Doul Bridge.

Fans parking in lots north of the ballpark would use Second and Third Streets and The Embarcadero to and from the north. Fans taking CalTrain would use both King and Townsend Streets to and from the ballpark. Most BART patrons were assumed to take the

bus bridge, and the remainder were assumed to walk to/from the Montgomery BART station via Second and Third Streets. Fans walking directly to the game from homes or offices would arrive in all directions, converging on routes to the site. Fans taking MUNI buses are assumed to walk to the nearest bus stop for their particular bus line, or to take the bus bridge from/to Market Street.

Figure IV.E.9a illustrates the pattern of pedestrian flows that would occur after a ball game, which would be the most intense period of pedestrian activity. The greatest volumes would occur on King Street between Second and Third Streets in front of the ballpark and on Third Street between King Street and the dedicated Giants parking lots south of the Channel. The flows would disperse rapidly with each block distance from the ballpark with King Street between Third and Fourth Streets, Second and Third Streets between King and Brannan Streets, and The Embarcadero carrying the greatest volumes. Fourth Street between King Street and the dedicated parking lots would also experience substantial flows, primarily because the Third Street sidewalks would not be wide enough for all pedestrian flow to the parking lots.

The calculation of future pedestrian level of service (LOS) is presented in Appendix C, Transportation and Circulation, Table X.C.13, p. A.128, for each of the analysis time periods.

As illustrated in Figure IV.E.10, p. IV.218, under existing-plus-project conditions, several locations would experience unacceptable LOS and a few facilities would be unable to accommodate the volume of pedestrians forecasted. Acceptable levels of service are those that are rated "crowded" or better as described by Pushkarev and Zupan (see Appendix C, Transportation and Circulation, Table X.C.7, p. A.119). A list of the sidewalk locations which would experience congested or worse conditions includes the following:

King Street - Second to Third Streets;
Third Street - Berry to Channel (east side);
Third Street - Berry to Channel (west side);
Third Street - Lefty O'Doul Bridge (east side);

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

● Figure IV.E.9a Pedestrian Circulation (Post-Game)

- Third Street - Lefty O'Doul Bridge (west side);
- Third Street - Lefty O'Doul Bridge to Fourth Street (east side);
- Third Street - Lefty O'Doul Bridge to Fourth Street (west side); and,

Third Street - King to Townsend Streets (east side).

Mitigation measures would be required for LOS designations at the "Congested" and "Jammed" levels, the latter being up to 25 persons per minute per foot (ppmpf) of the available sidewalk width. The worst locations (exceeding 25 ppmpf) include the sidewalk directly in front of the ballpark on King Street, the sidewalks on both sides of Third Street approaching and on the Lefty O'Doul Bridge, and the crosswalk at King at Third Street.

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure IV.E.10 Pedestrian Locations Approaching or Exceeding Capacity

Pedestrian volumes in excess of 25 ppmpf would exceed capacity and would result in queuing and delay of pedestrians.

Conditions would be crowded at several other sidewalk locations in the study area. At these locations, obstructions such as poles, newsstands, and trash containers restrict the effective width of the sidewalks. Specifically, on Third Street between King and Townsend Streets, obstructions in the sidewalk reduce the effective width of the east-side sidewalk from 13 ft. to 3.5 ft. On Third Street between Townsend and Brannan Street, the effective width of the east-side sidewalk is 2.5 ft., while the sidewalk itself is 10 ft. wide. In addition, crosswalks at three other study area intersections, King at Second and Third Streets and Third at Folsom Street, would be at unacceptable service levels.

Serious pedestrian capacity deficiencies would exist on the Lefty O'Doul Bridge, the Third Street sidewalks north of the bridge, and on the sidewalk along the south side of King Street along the ballpark frontage between Second and Third Streets. For a sellout game, as many as 14,500 pedestrians would desire to cross the China Basin Channel either at Third or Fourth Streets. This volume would exceed the combined capacity of the sidewalks on both bridges by over 100 percent. Theoretically, this would suggest delays of up to an hour for some persons. In reality, pedestrians would spill over into the traffic lanes on the bridges, particularly on Third Street. The spillover would result in a worsening of traffic conditions beyond those reported earlier in this section. The mitigation section, V.B. Transportation and Circulation, pp. V.6 - V.17, describes measures that would reduce these pedestrian/traffic impacts, including potential temporary closure of the bridge and parts of Third Street leading to the bridge before and after ballgames.

The MUNI Third Street light rail transit (LRT) system extension is currently under study. A number of potential alignments are being considered including a route that would use the Peter Maloney Bridge southbound and the Lefty O'Doul Bridge northbound for the LRT vehicles. If this alignment were to be used, the capacity of the bridges would be further reduced in terms of pedestrian circulation (assuming pedestrians were to use the roadway

area as a result of the spillover discussed above) and the effect would be to worsen an already significantly impacted facility.

The King Street sidewalk area in front of the ballpark would not have adequate capacity to accommodate the flows of pedestrians after a sellout baseball event. This sidewalk is proposed to be 25 ft. wide including a covered arcade area within the ballpark structure, the width reduced to 17 ft. in some areas. The columns and walls of the ballpark structure reduce its effective width further, and the flow rates would be much higher than the practical capacity of the sidewalk area. Pedestrians would likely experience lengthy delays trying to reach this area from the ballpark exits, and would tend to spill over into King Street and portions of Second and Third Streets.

The impact of pedestrian spillover into streets would be greatest during the period 15 to 20 minutes after games. Intersections near the ballpark such as the intersections of Second Street between Brannan and King Streets, Third Street between Brannan and Sixteenth Street, Fourth Street between Townsend and Sixteenth Street would operate at LOS F during these periods. The resulting queuing and delay would be substantial particularly after weekday afternoon games when traffic levels in the area are already high.

There are a total of four loading dock facilities located on the north side of King Street (between Second and Third Streets) at which delivery trucks can block sidewalks. Use of any of these loading docks during game-day study time periods would force pedestrians on the north sidewalk into King Street and create a hazardous situation. The level of service along this segment of sidewalk is at "impeded" (existing-plus-project conditions) at all study times and as such requires no additional improvements, assuming loading docks are not in use on game days when pedestrians are using this area.

The MUNI Metro Extension (MMX) and MUNI buses would load and unload passengers in the ballpark area on the north side of King Street between Second and Third Streets. The highest estimate of MMX and bus bridge users occurs during the weekday game post-game

period (peak hour - 4:30-5:30 p.m.) when over 8,600 transit-bound pedestrians exit the ballpark.

The impact of pedestrians leaving the ballpark (during the 15 minutes following a game) is described in the transit impact section under a "worst case" scenario. A "worst case" would result in a maximum queue of 2,250 persons forming at the MUNI platform. The platform is located in the median of King Street between Second and Third Streets and provides crosswalks mid-block and at Second Street. The operations analysis conducted for this area shows extremely congested pedestrian conditions at the southside crosswalk and sidewalk during all game-day study periods.

Without the implementation of mitigation measures such as closing King Street between Second and Third Streets to vehicular traffic before and after ballgames (see V.B., Transportation and Circulation, pp. V.9 - V.17), the estimated queue of 2,250 pedestrians would overwhelm the MMX platform and spill into the traffic lanes on King Street. If King Street were not closed to through traffic during peak, pre- and post-game periods, the impact of transit-bound pedestrians would be significant and the potential for pedestrian vehicle conflicts would be high.

The MUNI bus bridge would connect Market Street to the ballpark as described (see Figure IV.E.8 and 9) in the Project Transit Impacts subsection, pp. IV.185 - IV.189. Bus bridge coaches would load on Second Street at Market Street and would unload on Market Street between New Montgomery and Third Streets. It is estimated that as many as 3,500 people would be unloaded in the hour following a weekday game. This number of pedestrians would impact traffic and pedestrian circulation in the vicinity of the BART entrance and along Market Street.

Bicycle Impacts

Both fans and employees of the ballpark would generate bicycle traffic. The streets bordering the site are designated bike routes in the *Transportation Element* of the *General Plan*; therefore, no spur bike routes are needed to access the site. The primary bike access routes to the ballpark will be Second Street and Fifth Street from the downtown area (both proposed to have bike lanes in the *Bicycle Plan* adopted by the Parking and Traffic Commission January 7, 1997), The Embarcadero from Fishermen's Wharf, which currently has bike lanes, and Third Street from the south and Townsend Street from the west.

About 7,000 ballgame attendees would live in San Francisco (See Appendix C, Transportation and Circulation, Figure X.C.3, p. A.120, for percentage of City attendees); San Francisco residents are the primary pool of fans who would bike to the game. For weekend day games, about 5.4 percent of San Francisco residents who are ballpark patrons attending the game may bike, or up to 475 bicycle riders. About 375 ballpark patrons may bike to weekday afternoon games, or 4.2 percent of the resident market. For evening games, up to 125 ballpark patrons may bike, about 1.2 percent of the residents who would attend the game. Appendix C, Transportation and Circulation, Table X.C.14, p. A.135, provides background information on bicycle use and parking demand at local and national sports facilities that provides a basis for these estimates. A survey of visitors at the De Young Museum in Golden Gate Park was also used to formulate the demand estimate.[51]

It is estimated that many of the estimated 400 fans who would travel by BART would bring bikes for weekend games, but a few fans would also bring bikes on BART for weekday games and weeknight games. Although a bicyclist departing a day game may run into schedule difficulties with BART due to the peak hour restrictions for bikes on-board, a fan arriving for a night game on BART with a bike is possible since he or she would be using the reverse commute. (Bikes are allowed on BART at all times except peak hours in the main commute direction.)

Beginning October 1, 1996, BART began a six-month demonstration project that permits bicycles on all cars except the lead car. This demonstration project increases the number of bicycles that can be accommodated per train to between 28 (5-car train) and 63 (10-car

- train), assuming seven bicycles per car. The demonstration program has concluded and the policies instituted during that time remain in effect. There are some restrictions to bicycle use in the reverse commute direction during commute periods. The downtown Oakland Stations are off-limits to bicyclists during the commute period and westbound bicycle travel to San Francisco in the afternoon peak ends at the Embarcadero Station. BART personnel may refuse bicycle entry at any time due to crowded or unsafe conditions. If 1 percent of ballpark fans who take BART bring bikes, there would be 15 to 20 bikes on BART. If split evenly among the four directions—Concord, Fremont, Richmond, and Colma—there would be three to five bikes per train, which should be consistent with available capacity.

- CalTrain also has the ability to accommodate bicyclists. Each train can hold a maximum of 24 bikes in special racks designed for this purpose. Each train can also accommodate two wheelchairs.

The number of bicyclists would vary substantially depending on whether it is a day game or night game, weekend or weekday, (and on the weather), but overall demand estimates indicate that parking for 150 to 250 bicycles should be provided. The Giants have indicated that a secure bike parking area containing space for approximately 250 bicycles will be provided in a convenient location in the parking area south of the Channel.

Pedestrian/Bicycle Improvements

Mitigation measures to reduce significant pedestrian and pedestrian-saftey impacts are included in V.B. Transportation and Circulation Mitigation. The following actions are recommended in order to improve pedestrian access and bicycle use in the study area and at the ballpark site to reduce less-than significant impacts:

- On Third Street between King and Townsend Streets, the various obstructions on the east-side sidewalk including tow-away signs, trees and planter boxes, and news racks could be removed and relocated to provide minimum clear space of 8 ft. on the 13-ft.-wide sidewalk. On Third Street between Townsend and Brannan Streets, MUNI bus

shelter, garbage cans, sandwich signs, planter boxes and news racks could remain and/or be relocated.

- On Second Street between King and Townsend Streets, a 10-ft. sidewalk could be constructed on both the east side and west side of the street. Street furniture and necessary poles could be placed so that there is an effective width of 7 ft. The east side of the street is currently undeveloped so there is room for this improvement.

- To accommodate the bicycle parking demand, to further increase the bicycle mode share, and to conform with the Bicycle Parking Policy 28.1 of the Transportation Element to provide bike parking in new developments, the following improvements should be considered:

    1. Provide a minimum of 150 secure bike parking spaces with the flexibility to accommodate up to 250. This could be a fenced area watched by an attendant or security guard in the parking lot immediately south of China Basin Channel as close to the Lefty O'Doul (Third Street) Bridge as possible.

    2. Provide overflow bike parking for 200 to 300 bikes, with the flexibility to expand this as needed.

    3. Provide a secured storage area for roller blades and skateboards, possibly by either a valet-style check-in system or individual lockers.

    4. The availability of bicycle parking and the parking for roller blades and skateboards should be included in all transportation-related information and brochures.

- Bicycle and pedestrian access could be provided along Berry Street or along the north side of China Basin Channel from the project site to Seventh Street. This would be on Catellus Development Corporation property or in the Berry Street right-of-way.
- Improvements of Seventh Street from Sixteenth Street to Townsend Street, as described in V.B. Transportation and Circulation Mitigation Measures, could include bicycle lanes and sidewalks on both sides of the roadway.

FREIGHT LOADING AND SERVICE IMPACTS

Project freight loading and service deliveries would occur at two on-site locations. On the east side of the site off King Street a driveway would provide access to loading docks located under the left-field bleacher seating. Loading docks in this area would accommodate up to seven semi-trailer trucks. To the west side of the site off Third Street, a service driveway would provide access to the back of the Pavilion Building. This area would provide a loading dock for small trucks, and would be available to small service delivery vehicles such as cars, pickups, vans and small delivery trucks (2 axles). These types of vehicles would account for over 75 percent of the total daily deliveries to the Pavilion Building.

Large trucks (3+ axles) delivering to the Pavilion Building may have to use the loading docks on the east side of the project site. If so, a procedure for transferring materials to the Pavilion Building must be developed. This could involve the ferrying of material from the east-side docks to the west-side service area via smaller trucks or via an internal (on-site) connection between the two areas. Another means of large truck delivery would be to off-load in the west-side service area at the rear of the building.

Small delivery vehicles entering the west-side service area off Third Street would require three dedicated parking spaces in order to meet the estimated number of peak hour deliveries associated with the planned use. The Pavilion Building (136,000 sq. ft.) would contain a mix of retail, office, educational and exhibition uses.

The east-side service area would be accessed from King Street via the shared service driveway proposed by the Redevelopment Agency just east of the site. The loading docks located underneath the left-field bleacher seating would principally serve broadcast trucks, merchandise delivery, ballpark restaurants (total 45,000 sq. ft.) and waste removal. Driveway access to the service area would be shared with a proposed on-site 180-space parking garage under the ballpark bleachers to the south of the loading docks and the approximately 230-space marina parking garage east of the ballpark structure. Delivery vehicles turning right off of King Street into the service driveway would pass through a pedestrian crosswalk in front of a key ballpark entrance.

With few exceptions, large truck loading and unloading would not be scheduled on a game day. This is the current practice at 3Com Park[52] and it would be continued at the new site. The exceptions that occur on a game day at 3Com Park include media trucks and trucks that are involved in special promotion day games where free merchandise is distributed to ballpark customers. These truck trips typically occur prior to and after peak ballpark traffic periods.

Freight delivery and service vehicle activity would be generated by the development of the primary facility and auxiliary uses. The construction of the Pavilion Building and the development of two restaurants at the site would contribute to overall project freight and service vehicle parking demand. Table IV.E.40 shows the estimated demand for on-site freight and service vehicle parking associated with the ballpark restaurants and the Pavilion Building. The Pavilion Building is assumed to provide 43,000 sq. ft. of retail use with the remainder (93,000 sq. ft.) being utilized as office/commercial space. This assumption provides for a conservative demand estimate, because the proposed Pacific Bell Center as well as a proposed broadcast studio/office complex would likely generate fewer freight and service related trips than would a traditional office use.

The daily freight delivery and service vehicle demand estimate for the ballpark facility is based on existing baseball operations at 3Com Park,[53] increased by one truck (to four trucks) in order to provide a conservative analysis estimate. Available information on 3Com Park

TABLE IV.E.40
PROJECT FREIGHT DELIVERY AND SERVICE VEHICLE PARKING RATES AND DEMAND

Land Use	GSF (KSF)[1]	Daily Rate	Daily Generation	Peak Hour Rate	Peak Hour Generation[2]
Office	93	0.21	20	0.029	3
Retail	43	0.22	9	0.031	1
Restaurant	45	3.60	162	0.375	17
Ballpark[3]	N/A	N/A	4	N/A	1

Percent Daily Truck Activity by Vehicle Type	Daily Trucks			Peak Hour Trucks		
	Office	Retail	Restaurant	Office	Retail	Restaurant
Cars/Pickups . . .25%	6	2	41	1	0.4	4
Vans 42%	8	4	68	1	0.6	7
Small Delivery Truck[4] (2 axles) 9%	2	1	15	0	0.1	2
Large Delivery Truck[5] (2 axles) 19%	4	2	31	1	0.3	3
Large Delivery Truck[6] (3 axles) 4%	1	0	6	0	0.0	1
Tractor-Trailer (4 axles) 1%	0	0	1	0	0.0	0
Total (plus Ballpark Trucks): . . . 100%	21	9	162	3	1	17

Notes:
1. GSF = Gross Square Feet; - ksf = 1,000 sq. ft.
2. Peak hour truck generations unrelated to p.m. peak hour of background traffic.
3. Large trucks only.
4. Characterized as a small courier, mail truck or step van.
5. Characterized as mid-size Hertz rental truck or small furniture truck.
6. Characterized as a garbage truck.

Source: *San Francisco Guidelines for Environmental Review of Transportation Impacts*, July 1991, Appendix 7, Table 7.2. Wilbur Smith Associates, November 1996.

daily freight and service vehicle operations is for large trucks only. One loading dock is provided in the service delivery area and the number of large truck (from 2 to 4 axles) deliveries on a daily (non-game day) basis is three.

Total peak hour delivery and service vehicle demand is estimated at 21 vehicles. Peak hour truck trip generation generally occurs between 10:00 a.m. and 1:00 p.m. on weekdays, and

is unrelated to the overall p.m. peak hour of background traffic. The majority of peak hour small delivery vehicle activity directly related to the Giants organization is accounted for in the office use portion of the Pavilion Building. As shown in Table IV.E.40, the peak hour demand for large truck parking would be heaviest for the restaurant use. Estimated peak hour large truck demand at this location would be for five vehicles. Assuming average truck delivery/pickup of 25 minutes,[54] 16 trucks could be accommodated per hour at the east-side service area.

Peak hour activity at the east-side loading dock area would include up to 13 smaller delivery vehicles (vans and pick-up trucks). Based on the site plan dimensions, there would be adequate space for these vehicles to park in the loading area without impacting the movements of larger trucks.

The City Planning Code[55] requires that two off-street freight loading spaces be provided for 45,000 sq. ft. of restaurant use, and that one space be provided for the 43,000 sq. ft. of retail use in the Pavilion Building. The remaining 93,000 sq. ft. of office use in the Pavilion Building would require one additional space. The Planning Code does not provide a requirement for a sports facility or like use. The project includes seven off-street freight loading spaces and therefore would exceed Planning Code requirements for off-street freight loading spaces. The lack of a loading area for a large truck at the Pavilion Building would require that goods be moved a long distance to the ballpark loading area on the east side of the site. Loading operations must be strictly enforced by the Giants to discourage large trucks from parking on Third Street.

Freight Loading Improvement Measures

The project as proposed would not experience significant impacts in terms of freight and service vehicle operations. The proposed freight and service vehicle loading area would allow for all loading and unloading to occur on-site. Site plans indicate that there would be sufficient area for large trucks to maneuver once on-site.

It is recommended that the current practice at 3Com Park of limiting large truck operations on game days to the time periods well before and after games be continued at the new site. Without this improvement measure, there is potential for truck/passenger vehicle and truck/pedestrian conflicts at the service driveways (Third Street and King Street) during game day conditions.

- As no large truck loading facilities would be planned at the building, a plan should be developed for large truck loading and deliveries at the Pavilion Building. The Plan could include some or all of the following elements as is feasible:

  - All Pavilion Building large truck deliveries should be made at the east side loading docks. Off-loaded materials could then be transported to the west side service area in smaller trucks.

  - Allow large trucks to deliver at the Pavilion Building's west side service area only between the hours of 7:00 p.m. and 7:00 a.m. weekdays when no game is scheduled and on non-game weekends.

CONSTRUCTION IMPACTS

Construction of the project would require approximately 27 months to complete according to the Giant's construction management consultants.[56] This estimate assumes anticipated overlap between the foundation, superstructure and finish phases. The analysis also assumes that it is not necessary to excavate and remove large quantities of soil from the site. Table IV.E.41 summarizes by phase the daily maximum number of construction workers and construction worker vehicle trips that would be generated by the project. During the superstructure and finish phases of construction, as many as 490 to 570 construction workers would be on-site daily.

The construction staging area and truck loading and unloading activities would be located on-site. The first year of construction activity would consist of the demolition of existing structures, site excavation and construction of the foundation. Project construction truck operations are summarized in Appendix C, Transportation and Circulation, Table X.C.15, p. A.136.

TABLE IV.E.41 •
SUMMARY OF PROJECT CONSTRUCTION WORK TRIPS

Construction Phase	Demolition	Foundation	Super-Structure	Finish
Duration of Construction (months)	4.5	8	9	12
Peak Number of Workers On-Site per Day	61	195	490	570
Peak Number of Workers Vehicles per Day	43	140	360	420
Peak Number of Construction Vehicles On-Site per Day	14	25	25	22
Peak Number of Total Vehicles per Day	57	165	385	442
Average Duration of Work Shift	7:30 a.m. to 3:00 p.m.			

Source: Construction data received via 07/11/96 Kajima Corporation letter.
Wilbur Smith Associates.

The demolition phase (about 4.5 months) of construction would be characterized by the heaviest truck activity (peak 150 trucks per day). Truck operations during demolition would not typically be scheduled during peak periods of background traffic. During the foundation and superstructure phases, truck operations would lessen to approximately 80 trucks (maximum number) per day with an estimated 15 percent (about 12 trucks) of the operations occurring during the evening peak period. According to the Giants' management consultants, it would be unlikely that the overlapping of construction phases would result in a condition where the combined work force or the daily truck generation exceeded the estimated peak activity of an individual phase. Each subsequent phase is scheduled to begin following the peak period of the prior phase.

Typical truck routes from the site to local freeway ramps would be as follows:

- Truck Route #1: To I-280 South from the job-site, left on King Street from Second or Third Streets to Fifth Street (I-280 South Ramp).
- Truck Route #2: To I-80 East from the job-site, Third Street turn left on Brannan Street, right on Fifth Street, right on I-80 East.

Truck routes assume the completion of the I-280 ramps at Fifth and King Streets prior to breaking ground on construction of the project.

Work shifts would be scheduled from 6:00 a.m. to 6:00 p.m. on a daily basis. However, the typical shift for the majority of workers would be from 7:30 a.m. to 3:00 p.m. during the week.

According to the applicant's construction management consultants,[57] an estimated maximum of 570 workers per day would travel to the site during the peak phase of construction activity. As a result an estimated 442 daily worker vehicles would travel to the site and surrounding area during the peak phase of construction. An estimated 22 of these vehicles would park on the site and the remaining 420 would seek off- and on-street public parking spaces in the area. As the primary work shift is scheduled for 7:30 a.m. to 3:00 p.m., the majority of worker vehicle trips would arrive and depart the project area prior to the morning and evening peak periods of background traffic.

Construction of the project would result in an increase in demand for parking spaces by construction workers in the vicinity of the site. During the peak activity period, worker parking demand would be for approximately 420 spaces.[58] The inventory and availability survey of existing parking in the study area indicates that a demand for 420 additional spaces could not be met within a 10-minute walking distance of the site during the workday. A 10- minute walking distance is used to represent the boundary for construction worker parking, because workers are often required to transport tools and heavy materials from their vehicles to the job-site on a daily basis.

The existing conditions parking survey indicates that all on-street public parking spaces are occupied and that a total of 211 off-street spaces are available (weekday, midday) within a 10-minute walking distance of the site. This represents a shortfall of about 210 off-street public spaces under peak period construction conditions. The spaces that would be available are spread throughout the area in off-street lots. Some of these lots, as well as individual spaces, may not be accessible to larger passenger vehicles (pickup trucks, vans, etc.) typically used by construction workers. Constraints on stall size, aisle widths and lot access may further reduce the number of available parking spaces in the area for construction workers.

Project construction operations include plans for the closure of parking lanes and sidewalks adjacent to the project site on Third, Second and King Streets for the duration of construction. The proposed full-time closures of parking lanes and sidewalks immediately adjacent to the project site would result in the loss of approximately 45 on-street parking spaces. Peak period traffic flows, transit operations and pedestrian circulation would be affected by the proposed closures.

Existing weekday on-street parking occupancy within the study area is near capacity. The loss of 45 on-street spaces due to construction would further restrict available parking in the area. Proposed parking lane closures would also result in a reduction of available peak period roadway capacity. Parking lanes adjacent to the site are designated traffic lanes during peak period operations. King Street, which currently has no parking lane, will provide one parking lane upon completion of the I-280 Ramps/King Street Project in 1997. The closure of parking lanes would affect peak hour operations at the King Street intersections of Third and Second Streets.

MUNI operates several bus lines in the immediate vicinity of the project (see III.E. Transportation and Circulation, pp. III.92 - III.95) but there are no MUNI bus stops located adjacent to the site blocks on King, Third or Second Streets. MUNI peak period operations would be affected, however, in terms of reduced roadway capacity due to parking lane closures. MUNI Metro light-rail service will be provided in the median of King Street with a planned station at Second Street (in front of the project site) and Fourth Street.

The proposed closure of sidewalks adjacent to the project site would affect pedestrian circulation and MUNI Metro light-rail station access in the project site area. Pedestrian activity in the immediate vicinity of the site is characterized as light; however, sidewalk closures would force pedestrians on the south side of King Street to seek longer alternative routes to their destinations. The MUNI Metro light-rail will be operational during project construction; sidewalk closure would prevent access to the Second Street station from the project side of King Street.

The cumulative construction impacts of both the project and the proposed Catellus (north of Channel) development would cause further inconvenience in the area in terms of traffic, transit and pedestrian circulation. In the event of project construction overlap, it may be necessary to develop a joint management approach and traffic plan to effectively control circulation through the study area.

Construction Improvement Measures

The majority of construction worker vehicle trips would occur between the hours of 7:00 a.m. to 3:30 p.m. prior to the morning and evening peak periods of background traffic. Level of service analysis indicates that the King Street study area intersections would operate at acceptable levels. The construction worker vehicle trips would not have a significant impact on traffic operations in the study area.

Movement of trucks to and from the site would add to the overall vehicle congestion experienced during the morning and evening peak periods. In order to minimize conflicts between construction truck traffic and area traffic, all truck operations could be scheduled to avoid the morning and evening peak periods. In addition, the contractor could be required to use an on-site supervisor to direct all truck operations onto and off of the site.

- The Giants should coordinate ballpark construction activities with Catellus Development Corporation to assure that conflicts between ballpark and Mission Bay-related construction activities do not occur.

During peak construction periods, there would be a temporary parking demand from construction workers for up to a maximum of 420 spaces. The existing public parking supply within a 10-minute walking distance of the project site would not be sufficient to meet this demand. The project sponsor could provide off-street parking for construction workers

in vacant lots located to the south of the site along Third Street. These areas have already been identified as parking lots which would serve the proposed ballpark.

In order to provide parking for 420 construction worker vehicles, approximately 3 to 4.2 acres would be necessary. This estimate is based on a rough calculation of 300 to 430 sq.ft. per parking space. The vacant parcel bordered by Third Street to the west and China Basin Street

to the east and north and Mission Rock to the south would provide sufficient area to meet peak-phase worker parking demand. Walking distance from this area to the job site is approximately six to eight minutes. There are a number of other parcels south of the site in the immediate vicinity of the Third Street, China Basin Street parcel that would be adequate for temporary parking lots. The applicant would be responsible for lot grading, design/layout, access and security.

The project sponsor would identify a neighborhood construction coordinator to assure that all of the construction mitigation and improvement measures would be implemented. The phone number of the coordinator would be posted at the construction site and made known throughout the adjacent community to assure prompt response to complaints.

NOTES - Transportation and Circulation

1. Letter from Alfonso Felder, Legal and Public Affairs Coordinator, San Francisco Giants, October 11, 1996.*
2. Wilbur Smith Associates, Field Surveys: April-August 1996, 3Com Park at Candlestick Point.
3. When baseball teams play a series of games several days in a row at their home field, it is called a "home stand." Teams will then go "on the road" to play several "away" games against rival teams at the rivals' home fields.
4. Jack Bair, Vice President and General Counsel, San Francisco Giants, May 23, 1996.
5. Jack Bair, Vice President and General Counsel, San Francisco Giants, telephone conversation, December 1996.
6. San Francisco Planning Department, *Citywide Travel Behavior Survey 1993,* Summary Findings, Phase I, p. 3.
7. Peter Straus, Planning Department, MUNI, telephone conversation, May 23, 1996.
8. Refer to Mitigation Section of this report for a discussion of potential ferry service to the ballpark. Preliminary contact by the Giants indicates interest on the part of ferry operators.
9. Wilbur Smith Associates, San Francisco traffic counts, surveys, April-August, 1996.
10. Wilbur Smith Associates, San Francisco traffic counts, surveys, April-August, 1996.
11. Wilbur Smith Associates, *MUNI Bayshore Corridor Planning Study*, 1993.*
12. Economic Research Associates, *Economic Impacts of San Francisco Giants in a New Downtown Ballpark*, 1996.*

13. Economic Research Associates, *Economic Impacts of San Francisco Giants in a New Downtown Ballpark*, 1996.

14. Letter from Alfonso Felder, Legal and Public Affairs Coordinator, San Francisco Giants, October 11, 1996.

15. Letter from Alfonso Felder, Legal and Public Affairs Coordinator, San Francisco Giants, October 11, 1996.

16. Geographic distribution percentages are a composite of data from all three surveys. See *Transportation Background Report for the San Francisco Giants Ballpark at China Basin*, March 1997, Chapter 3, Table 3-5 for more detail on survey results.

17. Parallax Market Research, Giants Customer Study, 1988 and 1993.*

18. Parallax Market Research, Giants Customer Study, 1993.

19. Economic Impact of Oriole Park at Camden Yards, December 1992.*

20. The highest proportion of non-home based trips to the game was 40 percent, assumed to occur on a weekday evening when many fans would be coming from downtown work locations and others would arrive early to go out to eat, etc. Progressively smaller proportions are assumed for weekday afternoon and weekend day games. It is assumed that weekday night fans would not go back downtown but would return to their residences after the game, while some fans would go to the downtown area after a day game.

21. Bob Fossa, Scheduling Statistician, MUNI, telephone conversation, May 23, 1996.

22. Larry Stueck, SamTrans, telephone conversation, December 3, 1996.

23. Tay Via, Esq., Coblentz, Cahen, McCabe & Breyer, telephone conversation with EIP on December 20, 1996, relaying information from Alfonso Felder, Legal and Public Affairs Coordinator, San Francisco Giants.

24. San Francisco Planning Department and Redevelopment Agency, *Transbay 2020 Concept Plan*, September 1996.

25. University of California, *UCSF Long Range Development Plan Final EIR*, SCH #95123032, January 1997.*

26. San Francisco Planning Department, *Mission Bay Final EIR* (SCH #86070113, 86.505E, certified August 1990).

27. Study time periods impacted include: 3:30 - 4:30 p.m., 4:30 - 5:30 p.m., and 6:30 - 7:30 p.m.

28. Peter Straus, Planning Department, MUNI, telephone conversation, May 23, 1996.

29. Peter Straus, Planning Department, MUNI, telephone conversation, May 23, 1996.

30. Peter Straus, Planning Department, MUNI, telephone conversation, May 23, 1996.

31. The 150 "crush" capacity was obtained through discussion with MUNI. This number can be carried safely and reliably by MUNI. Absolute maximum crush capacity of vehicle is 220 passengers.

32. P. Adams, General Manager, MUNI, memorandum to R. Nothenberg, Chair, Transportation Commission, February 27, 1996.*

33. Data from Transportation Research Circular 212, January, 1980.

34. See the *Transportation Background Report for the San Francisco Giants Ballpark at China Basin*, March 1997, Chapter 5, subsection on Transit Improvements, for a detailed discussion of MMX operation before and after ballgames.

36. Dean Leonard, Operations Support and Review Group, BART, telephone conversation, February 26, 1997.

37. Peninsula Corridor Joint Powers Board, Resolution No. 1996-39, adopted November 14, 1996.*

38. Peninsula Corridor Joint Powers Board, Resolution No. 1996-39, adopted November 14, 1996.

39. Steve Perry AC Transit, personal communication, November 21, 1996.

40. Larry Stueck, SamTrans, telephone conversation, December 3, 1996.

41. On-street parking is not included in the unoccupied supply of parking for the project for weekday midday period. Unoccupied on-street parking is assumed to be available for Giants fans during weekday evenings and weekend midday periods.

42. This discussion of available parking is based on the number of *unoccupied* parking spaces within the study area. This assumes that the utilization of the parking supply would be similar to the existing conditions and that unoccupied parking spaces could be used by Giants' patrons. See Table X.C.5 in the Transportation Appendix for a summary of parking space inventory and occupancy.

43. The weekend parking analysis is for a Saturday; considerably more parking is available and would continue to be available on Sunday afternoons.

44. Bill Wycko, Department of City Planning, telephone conversation, July 16, 1996.

45. The 350 spaces are located within a 10- to 15-minute walk distance from the project site. The occupied spaces in these lots have already been accounted for in the supply of available spaces. Therefore, for analysis purposes, the total number of available spaces would be reduced only by the number of *unoccupied* spaces during the survey periods if these lots were to be permanently removed from the parking inventory. For example, during weekday afternoons, spaces in the 10- to 15- minute distance have an 81.1 percent occupancy rate (see EIR Appendix C, Table X.C.5). Therefore, about 64 of these 850 spaces would have been available but have been subtracted from the total available during weekday afternoons to account for future development. During weekday evening only 268 of these spaces are occupied, so a larger number of available spaces would be lost to development.

46. Construction of planned development and transportation improvements would remove approximately 350 public, off-street spaces from the study area parking inventory. Based on existing occupancy, the available supply of public, off-street parking would be reduced from 1,072 to 1,008 spaces during the weekday, from 4,629 to 4,370 spaces during weekday evenings, and from 4,336 to 4,100 spaces on weekends.

47. Parking facilities that are 95 percent occupied are considered at capacity. Parking systems operate most efficiently at an occupancy rate of 85 to 95 percent, so that entering cars do not have to search the entire system to find a space.

48. The northern and western most portions of the study area are located within the proposed Transbay Redevelopment Area, which proposes development of between 3,200 and 8,000 new housing units and between 6.4 and 9.6 million square feet of new office development over the next 30 years (*Transbay 2020 Concept Plan*, August 1996).

49. The 375 spaces are located within the 10- to 15-minute walk distance from the project site. The occupied spaces in these lots have already been accounted for in the supply of available spaces. Therefore, for analysis purposes, the total number of available spaces would be reduced only by the number of *unoccupied* spaces during the survey periods if these lots were to be permanently removed from the parking inventory. The available supply of public, off-street parking would be further reduced in the year 2015 from 1,010 to 940 spaces during weekday games, from 4,370 to 4,090 spaces during weekday evening games, and from 4,100 to 3,845 spaces during weekend games.

50. To the extent that residents responding to the survey either park on-street or in off-street, public parking lots, their parking use and occupancies have already been included in the parking inventory and occupancy for weekday afternoon, weekday evening, and weekend afternoon ballgame periods.

51. DeYoung Museum, "Visitor Survey," December 1966.*

52. Angie Perrilliat, Personnel Manager, San Francisco Giants, telephone conversation, July 18, 1996.

53. Angie Perrilliat, Personnel Manager, San Francisco Giants, telephone conversation, July 18, 1996.

54. *The San Francisco Guidelines for Environmental Review: Transportation Impacts*, July 1991.

55. City and County of San Francisco, City Planning Code: Section 152.1 p. 76.

56. Dennis Biggs, Construction Management Consultant, Kajima International, facsimile transmission, July 11, 1996.*

57. Dennis Biggs, Construction Management Consultant, Kajima International, facsimile transmission, July 11, 1996.

58. Dennis Biggs, Construction Management Consultant, Kajima International, facsimile transmission, July 11, 1996.

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

F. NOISE

Noise impacts from the proposed ballpark would result from increases in traffic on local streets, in the vicinity of parking lots and garages and near freeway on- and off-ramps. Noise impacts could also result from cheers and applause and other crowd-related activities during a ballgame or another similar event at the ballpark. Concerts at the ballpark could also cause noise impacts from amplified music. Construction noise would have a short-term effect, and therefore would not be considered a significant impact. Pile-driving noise, however, is exceptionally loud and has been addressed below.

The following discussion includes: 1) an explanation of the analysis methodologies used to estimate traffic noise, crowd noise, and concert noise; 2) results of the analysis of traffic noise using 24-hour day-night average (L_{dn}) levels at residential receptors and one-hour L_{eq} levels at noise-sensitive non-residential receptors; and 3) analysis of crowd noise from a baseball game, crowd and music noise from a full capacity rock concert, and crowd and music noise from a smaller musical event in a canopied subsection of the ballpark. Traffic noise was analyzed for existing-plus-project conditions, for cumulative-plus-project conditions, and for a second cumulative scenario with additional growth to account for more development in Mission Bay including a University of California at San Francisco campus, all as described below.

NOISE ANALYSIS METHODOLOGY

Traffic Noise

Noise from the motor vehicles traveling to/from the proposed ballpark was modeled using the Caltrans SOUND32 computer model, an adaptation of the Federal Highway Administration's Highway Traffic Noise Prediction Model (FHWA-RD-77-108). Noise measurements and traffic counts along one or two adjacent roadway segments, performed simultaneously, were

used to calibrate the model. In some cases, traffic volumes for more distant traffic noise sources (e.g., freeways) were included in the model data to achieve a better agreement between noise levels measured at specific locations and the results of model predictions of existing noise at those locations.

Traffic noise levels were modeled at 13 noise-sensitive land uses (each near a measurement location, listed in Table III.F.4, p. III.117) in the traffic study area under the following five traffic scenarios from the transportation analysis:

- Existing Redistributed: Existing traffic, redistributed to account for new transportation facilities now under construction
- Existing Redistributed + Project Traffic
- Cumulative 2015: Cumulative growth in traffic to the year 2015 without the ballpark project
- Cumulative + Project Traffic (2015)
- UCSF/Mission Bay Cumulative: A second cumulative analysis accounting for additional growth from full development of the Mission Bay area south of China Basin Channel, including a new University of California at San Francisco campus, plus the ballpark traffic

The L_{dn} was used to evaluate traffic noise impacts for residential land uses because these uses are sensitive to noise impacts during an entire 24-hour period, especially at night (when the L_{dn} adds a 10 dBA penalty to ambient noise). Weekday night baseball games would cause the greatest traffic noise impacts because post-game traffic would occur after 10:00 p.m. Noise from weekday pre-game and post-game traffic volumes was included in the 24-hour average, along with the existing ambient noise during the other 22 hours of a day, in the course of calculating the L_{dn} for the analysis of noise impacts at residential receptors.

The L_{eq} for the noisiest hour was used to evaluate traffic noise impacts for non-residential noise-sensitive land uses because these uses would be occupied primarily during daytime

and/or evening hours. For daycare centers and schools, the greatest noise sensitivity was assumed to occur during weekday mornings and afternoons. Therefore, maximum hourly traffic noise impacts were evaluated using weekday afternoon 3:30 - 4:30 p.m. traffic data.

At St. Gregory's Church, near the intersection of Mariposa and De Haro Streets, evening noise exposure was assumed to be more disruptive because most daytime church activities take place in the mornings, before ballpark traffic would begin, and evening activities often begin at 7:00 p.m. Therefore, maximum hourly traffic noise impacts were evaluated using weekday 6:30 - 7:30 p.m. traffic data.

Baseball Game Crowd Noise

Crowd noise from the proposed ballpark was estimated by using the Environmental Noise Model (ENM) computer model.[1] The ENM model incorporates the effects of topography, wind, and temperature gradients on noise propagation, when these issues are relevant to the analysis. The attenuative effects of the ballpark walls (as specified in the project plan and section drawings provided the project architect) and those of other nearby buildings were taken into account by the model. The model was calibrated so that the noise levels predicted for the rim of the proposed ballpark were consistent with those measured at 3Com Park, after accounting for differences in crowd size, as explained below.[2]

Noise measurements at 3Com Park were made on Friday evening, July 19, 1996 with the San Francisco Giants playing the Atlanta Braves.[3] The reported attendance was 17,560.

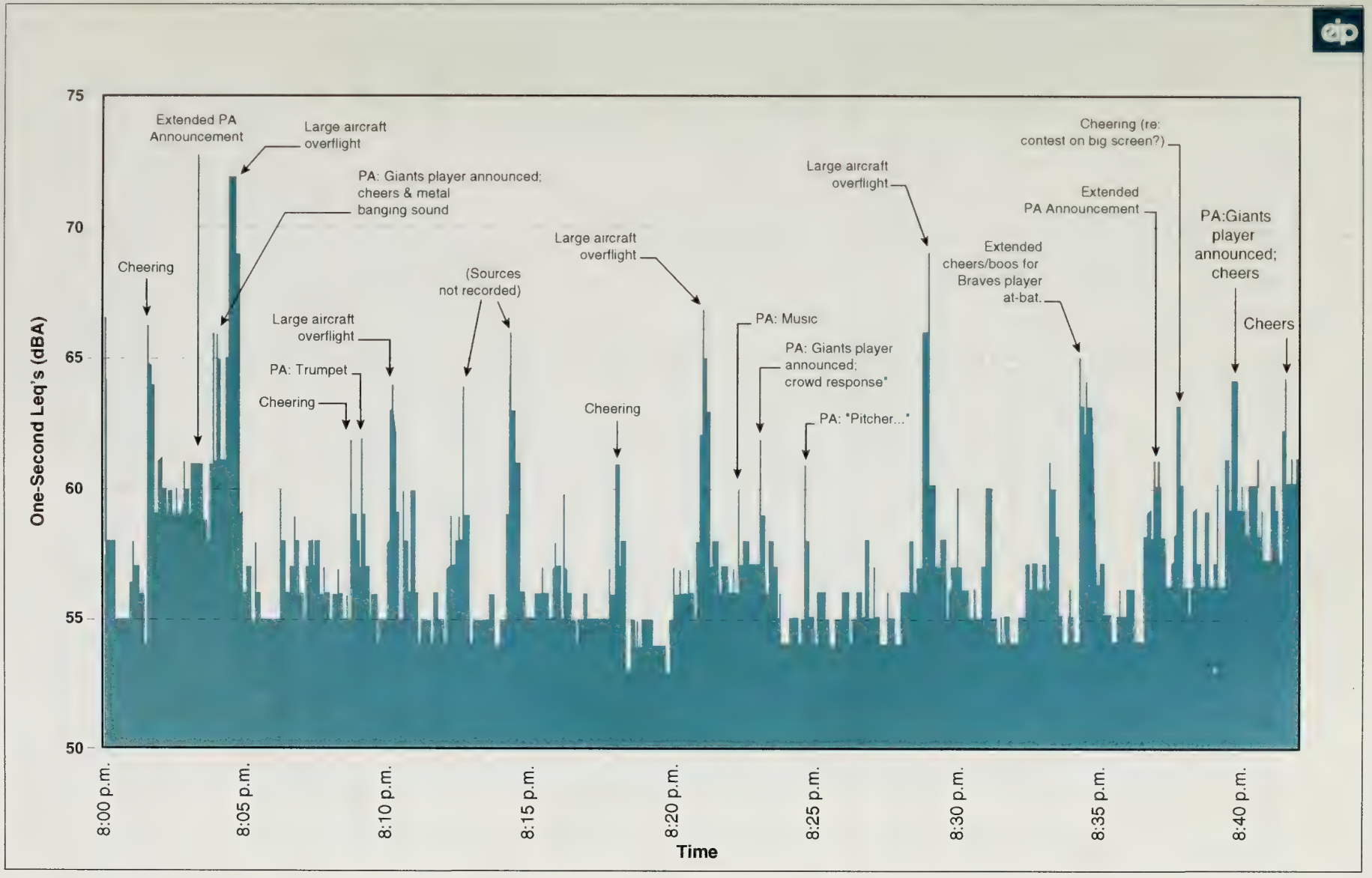
Measurements were made at two locations inside the stadium near the stadium rim.[4] Noise came from the crowd, including cheering and the sound of fans hitting the aluminum bleachers, and from the public address (PA) system, including announcements and music. Maximum noise levels from crowd cheering were about 80 to 90 dBA. Public address (PA) system maximum noise levels ranged from about 85 to 87 dBA.

Outside 3Com Park, measurements were made at two locations on Bay View Hill to the west of the stadium. One of these locations was at about the same elevation as the rim of the stadium;[5] maximum noise levels here ranged from about 60 to 63 dBA for crowd cheers and from about 55 to 57 dBA for PA system noise. The second location outside the stadium was approximately 10 to 20 feet (ft.) higher than the rim of the stadium,[6] with a clear view of the playing field; maximum noise levels at this location ranged from 63 to 66 dBA for crowd cheers and 60 to 63 dBA for PA system sounds. Figure IV.F.1 shows the variation of noise levels during the 40-minute measurement period at the higher location on Bay View Hill and identifies the sources responsible for selected noise level peaks.

With a crowd of about the size expected in the proposed ballpark, the cheering noise levels at the measurement locations outside 3Com Park would be about 5 dBA higher than measured, based on a ratio of the noise made with the smaller number of people in attendance at the game measured and noise with the larger number of people (about 40,000).

Crowd noise from the project was analyzed using a one-hour L_{eq}, rather than the 24-hour L_{dn}, because baseball games last approximately three hours and would not occur on a daily (or nightly) basis. PA system noise was not included in the ENM computer model for the new ballpark because, based on the noise measurements at 3Com Park, it would be less than the crowd noise. The PA system at 3Com Park is a distributed speaker system, meaning that the system uses speakers that are distributed around the stadium and each speaker can reach its designated area using a lower sound volume (compared to older systems that use a small number of speakers with volumes turned up so that most fans can hear the announcements). A similar, distributed speaker system is proposed for the ballpark.[7]

The model included assumptions about the physical barrier to noise provided by the ballpark structure for relevant locations (the ballpark structure would not provide a noise barrier at



SOURCE: EIP Associates

GIANTS BALLPARK

Figure IV.F.1 Noise Measurements on Bayview Hill Outside of 3Com Park (Portion of Giants vs Braves Game)

upper levels of apartment buildings near the ballpark but would reduce noise at lower levels and on local streets and sidewalks). Existing and proposed buildings in the ballpark area, such as the existing China Basin and China Basin Landing Buildings at Third and Berry Streets and the buildings under consideration by Catellus Development Corporation at King and Third Streets, were also included in the model as physical barriers for some receptor locations. The model was calibrated such that crowd noise estimates at the rim of the new ballpark were consistent with the measured crowd noise at 3Com Park as adjusted for the larger attendance assumptions.

General aviation noise, such as that originating from small planes trailing advertising banners, was not included in the analysis, although this noise is considered by some to be an annoying, if temporary, noise source. The measurements at 3Com Park did not record any small-plane overflights (it was a night game in July and by 8:00 p.m. it would have been difficult to see the advertising banners), and a baseline was, therefore, not available to include in the model.[8]

Concert Noise

The ENM model was also used to estimate the noise impacts of concerts at the proposed ballpark. As explained in IV.E. Transportation and Circulation, p. IV.103 it is anticipated that no more than five large events utilizing all of the ballpark's existing seat and temporary seats in the field would occur in a year at the ballpark. In addition, other concerts would be held using less than the ballpark's seating capacity. A noise analysis was prepared because the noise effects of amplified music would be noticeably different from traffic and ballpark crowd noise.

Information on rock music at outdoor concert facilities was obtained from *Shoreline Amphitheater Sound Propagation Testing*[9] and *Control and Management of Outdoor Concert Sound - Review of Experience in North America.*[10] The assumed sound power level of a

concert speaker system at the ballpark was based on the data presented in the analysis of the Shoreline Amphitheater.[11]

Speakers were assumed to have no "directionality" for a large rock music concert. Individual speakers, such as those in a home music system, are louder when the listener is directly in front of the speaker and less loud as the listener moves to the side and back of the speaker; this is called speaker directionality. Speaker directionality was not factored into the model for large rock music concerts because the speakers were assumed to be distributed around the entire ballpark to reach attendees seated in all ballpark seats as well as in seats placed on the field; therefore music sound would be distributed in all directions. The stage was assumed to be in centerfield, behind the second base location, with seating "in the round" throughout the ballpark, including use of outfield bleachers and seating on the field in front of the stage. The audience was assumed to be 50,000 people.

A smaller music concert was also studied, with an attendance of 10,000 people in a fabric-covered, enclosed portion of the ballpark, with the stage approximately at the pitcher's mound. Small events of this type (many with substantially fewer than 10,000 attendees) could occur more often, up to 30 to 40 times per year (see Project Description, p. II.22), although not all of the events are likely to be music events. For this scenario, some speaker directionality (reduction in sound levels away from the front of the speaker) was included because patrons would not be seated throughout the ballpark seating area. No reductions were assumed for low frequency (bass) sounds; at right-angles to the front of the speakers (90°), it was assumed that mid and high frequencies (treble) would be reduced by 5 to 10 dBA. This assumption is conservative, as speakers would normally exhibit greater reductions, but it was also assumed that there would be some distribution of speakers in the enclosed seating area, reducing the directionality of the system somewhat.

The potential effect of a temperature inversion on the transmission of music from the ballpark to distant receptors was assumed to be minimal, as the breezy environment at sites

near the edge of the Bay will tend to mix the air above the ground, thereby removing the temperature gradient.[12]

Evaluation Criteria

San Francisco has no quantitative threshold for significance related to increases in noise levels. In general, project increases in noise are modeled and presented quantitatively, but are evaluated qualitatively by asking the following questions:

(a) Would the increase in noise at any sensitive receptors be reasonably considered substantial?

(b) Would the increase in noise substantially affect the use and enjoyment of adjacent areas or facilities?

To a great extent, noise is a personal experience, and noise levels that some people may find acceptable are annoying or unacceptable to others. For this reason, recent efforts to develop standard impact criteria have focused on the level of annoyance, or the percentage change in the number of people who would likely be annoyed by noise increases. Appendix D presents further information on criteria developed by the Federal Transit Administration (FTA), which consider noise increases in relation to existing noise levels. Thus, the higher the ambient noise levels, the lower the increase in noise required to increase the percentage of people who will be annoyed by the noise.

The FTA criteria have not been adopted by the City, and are presented for informational purposes only. San Francisco is an urban area, where high levels of noise are commonly accepted. Under the FTA criteria, a "severe impact" may occur in a noisy area, even if the increase in noise would be relatively small or possibly imperceptible. Under CEQA, a significant impact would occur only if there is a substantial adverse change in environmental conditions.

If increases in the overall hourly average noise level (L_{eq}) in the surrounding area caused by amplified music were limited to less than three decibels, substantial community complaint is not likely to occur. At this limit, music would be noticeable at many nearby receptors because it has a different character than the ordinary community noise, but would not be expected to cause substantial community complaint, and would not be considered a substantial adverse change in the environment.[13]

TRAFFIC NOISE IMPACTS

Traffic noise that now occurs on Jamestown Avenue, Gilman Avenue, Third Street and other streets in the vicinity of 3Com Park before and after baseball games would no longer occur with the proposed project. Traffic noise would increase on streets in the vicinity of the new ballpark.

Existing Redistributed Traffic Plus Project Traffic Noise

Table IV.F.1 summarizes the modeled noise levels from existing redistributed traffic, and from existing plus project traffic at thirteen sensitive receptor locations, and shows the change in noise level due to project traffic. Existing traffic was redistributed to new transportation facilities now under construction (e.g., the King Street ramps to I-280) as part of the transportation analysis (see IV.E. Transportation and Circulation, p. IV.88).

As shown on this table, project traffic would cause L_{dn} near the residential land uses studied to increase by 0.1 to 1.4 dBA. Existing traffic noise levels on most of the streets near residential receptors studied are high enough (above 65 dBA) for the *San Francisco General Plan Environmental Protection Element* to discourage new residential developments unless substantial noise reduction features are included in their designs. Newer residential buildings, such as those in the South Beach Redevelopment Area (Delancey Street and Bay Crest Apartments), were required to meet interior noise standards established in Title 24 of the California Code of Regulations and therefore include noise insulation based on existing noise levels at these sites. The project traffic noise increment, while small, could add to the level of annoyance of some residents on the streets studied and on other similarly noisy streets that could be affected by ballpark traffic if they live in older structures that may not include sufficient noise insulation.

TABLE IV.F.1 ●
TRAFFIC NOISE LEVELS: EXISTING REDISTRIBUTED TRAFFIC VOLUMES[1]

Receptor			Nearest Major Traffic Noise Sources		Noise Level (dBA)		
Site #[2]	Type	Description	Name	Segment[3]	No Project	With Project	Project Increase
					L_{dn}		
2	Residential	Bay Crest Apartments	Harrison St.	W:Main St.	72.3	72.8	0.5
3	Residential	Residence at 29 Guy Place	First St.	@ Guy Pl.	67.0	67.2	0.2
4	Residential	Mendelsohn House (senior housing)	Folsom St.	E:Fourth St.	71.1	71.2	0.1
6	Residential	Delancey Street Apartments	Brannan St.	E:Delancey St.	67.8	68.3	0.5
7	Residential	Steamboat Apartments	The Embarcadero	S:Townsend St.	68.9	69.4	0.5
8	Transient Lodging	San Francisco RV Park	Townsend St.	W:Lusk St.	72.3	72.3	0.0
9	Park/Residential	South Park, Residence at 171 South Park Dr.	Third St.	@ South Park Dr.	66.0	67.4	1.4
10	Residential	Upper-story Residence at 550 Third St.	Third St.	N:South Park Dr.	73.5	74.7	1.2
11	Transient Lodging	Hotel Utah	Fourth St.	@ Bryant	76.6	76.9	0.3
12	Residential	Residence at 480 Sixth St.	Sixth St.	N:Bryant St.	74.5	74.7	0.2
13a	Residential	Residence between Rhode Island & De Haro	Mariposa St.	N:De Haro St.	67.7	69.1	0.6
					L_{eq} (1 hour)		
1	School	Daycare Center in Hill Plaza	Harrison St.	E:Spear St.	68.2	68.4	0.2
5	School	Filipino Educational Center	Harrison St.	W:Fourth St.	74.7	75.6	0.9
13b	Church	St. Gregory's Episcopal Church	Mariposa St.	N:De Haro St.	65.1	70.5	5.4

Notes:

1. Existing traffic was redistributed to account for new transportation facilities now under construction (e.g., completion of the King Street ramps to I-280, extension of Fifth Street between King and Berry Streets).
2. Refer to Figure III.F.1, p. III.116, showing location of sites.
3. W: means west of (e.g. site 2 is on Harrison St. west of Main St.); @ means at the intersection of; E: means east of; S: means south of; and N: means north of.

Source: EIP Associates.

At 13 of the 14 sites analyzed traffic noise increases were projected to be slightly greater than or less than 1 dBA.

With project traffic, at Saint Gregory's Episcopal Church (site #13b) before a weekday night game (6:30 to 7:30 p.m.), traffic noise would cause the one-hour L_{eq} to increase by up to 5.4 dBA. This change would be noticeable to most people in the area. The project traffic noise increment could increase the frequency of traffic-related nuisance noise intrusions at the church when ballgame traffic increases coincide with the time that a church activity is taking place. Weekday night games are expected to occur about 42 days per year (see IV.E. Transportation and Circulation, p. IV.77); in addition, there could be an occasional weekend night game, one to five large nighttime events, and several additional sold-out non-ballgame events, annually. Thus, noise impacts along this section of Mariposa Street could occur 45 times or more per year and would last about one hour during the peak travel time before a ballgame. Traffic would not be expected to cause similar noise increases after baseball games, because the ballpark-related traffic on this segment of Mariposa Street would come primarily from the U.S. 101 Vermont Street off-ramp; there is no corresponding on-ramp accessible from Mariposa Street, so Mariposa would not be an attractive alternative to congested main routes leaving the ballpark. As explained in Noise Analysis Methodology above, p. IV.237, the City has no quantified thresholds of significance for noise. The occasional, short-term (1-2 hour) 5.4 dBA increase in exterior traffic noise levels would be noticeable, and could be annoying to some churchgoers. The interior noise levels would be less than 70.5 dBA due to sound level reductions from building walls, and would be unlikely to meaningfully or substantially impact the usefulness of the facility.

The Transportation Mitigation Section suggests a traffic routing plan with detours and other traffic control measures (see V.B. Transportation and Circulation, pp. V.2 - V.60). One of the traffic control measures would place a permanent sign directing ballgame traffic exiting U.S. 101 at the Vermont Street exit to use Vermont Street rather than Mariposa Street. This measure alone would not reduce ballpark-related Mariposa Street traffic volumes substantially. It is estimated that only about 30 of the 280 vehicles traveling to the proposed ballpark

during the peak hour before a weekday night game would be diverted from Mariposa Street. This would reduce the projected evening peak hour L_{eq} by only about 0.1 dBA, from 70.6 dBA without such traffic controls to 70.5 dBA with them.

Noise levels at St. Gregory's Episcopal Church on Mariposa Street at De Haro Street could be reduced by stationing a Parking Control Officer at Mariposa and Vermont Streets near the U.S. 101 off-ramp to direct ballpark traffic down Vermont Street to Sixteenth Street (a non-residential area). (See V.B. Transportation and Circulation, pp. V.6 - V.7, for a discussion of use of Parking Control Officers. Also note that this measure would not be warranted by traffic volumes on Mariposa; the traffic analysis estimates about 250 to 280 additional cars would use this portion of Mariposa Street, and level of service at the Mariposa and De Haro Streets intersections would remain B.) While not required to mitigate any significant impact, this improvement measure would limit the traffic increases that were shown to cause additional noise along this western portion of Mariposa Street, thereby reducing noise increases near this sensitive receptor.

Cumulative (Year 2015) Traffic Noise

Table IV.F.2 summarizes the modeled noise levels from existing, cumulative, and cumulative-plus-project traffic at thirteen sensitive receptor locations.

With cumulative growth in traffic alone in 2015, 24-hour traffic noise levels would increase by 0.3 to 0.9 dBA at most residential study locations; at three of the residential study locations cumulative traffic growth would not measurably change noise levels. Cumulative traffic growth on streets near the non-residential study locations would cause increases in the one-hour L_{eq} of 0.2 to 0.7 dBA.

Project-induced traffic, when added to cumulative traffic in the year 2015, would add to the overall noise environment at the sites studied and at similar sites along main access routes

TABLE IV.F.2 ●
PROJECT TRAFFIC NOISE LEVELS: CUMULATIVE TRAFFIC VOLUME (YEAR 2015)

Receptor			Nearest Major Traffic Noise Sources		Noise Level (dBA)					
					Traffic Scenario			Impact Determination		
									Cumulative Change	
Site #[1]	Type	Description	Name	Segment[2]	Exist Redist.[3]	Cumulative No Project (2015)	Cumulative With Project (2015)	Project Increase	No Project Increase	With Project Increase
					L_{dn}					
2	Residential	Bay Crest Apartments	Harrison St.	W:Main St.	72.3	73.2	73.8	0.6	0.9	1.5
3	Residential	Residence at 29 Guy Place	First St.	@ Guy Pl.	67.0	67.0	67.3	0.3	0.0	0.3
4	Residential	Mendelsohn House (senior housing)	Folsom St.	E:Fourth St.	71.1	71.4	71.5	0.1	0.3	0.4
6	Residential	Delancey Street Apartments	Brannan St.	E:Delancey St.	67.8	68.3	68.7	0.4	0.5	0.9
7	Residential	Steamboat Point Apartments	The Embarcadero	S:Townsend St.	68.9	69.4	69.7	0.3	0.5	0.8
8	Transient Lodging	San Francisco RV Park	Townsend St.	W:Lusk St.	72.3	72.3	72.3	0.0	0.0	0.0
9	Park/Residential	South Park, Residence at 171 South Park Dr.	Third St.	@ South Park Dr.	66.0	66.6	67.8	1.2	0.6	1.8
10	Residential	Upper-story Residence at 550 Third St.	Third St.	N:South Park Dr.	73.5	74.0	75.0	1.0	0.5	1.5
11	Transient Lodging	Hotel Utah	Fourth St.	@ Bryant	76.5	77.0	77.3	0.3	0.5	0.8
12	Residential	Residence at 480 Sixth St.	Sixth St.	N:Bryant St.	74.5	74.5	74.8	0.3	0.0	0.3
13a	Residential	Residence between Rhode Island & De Haro	Mariposa St.	N:De Haro St.	67.7	68.4	68.8	0.4	0.7	1.1
					L_{eq} (1 hour)					
1	School	Daycare Center in Hills Plaza	Harrison St.	E:Spear St.	68.2	68.8	69.2	0.4	0.6	1.0
5	School	Filipino Educational Center	Harrison St.	W:Fourth St.	74.7	75.4	75.9	0.5	0.7	1.2
13b	Church	St. Gregory's Episcopal Church	Mariposa St.	N:De Haro St.	65.1	65.3	70.6	5.3	0.2	5.5

Notes:
1. Refer to Figure III.F.1., p. III.116, for a map showing locations.
2. W: means west of (e.g. site 2 is on Harrison St. west of Main St.); @ means at the intersection of; E: means east of; S: means south of; and N means north of.
3. Existing traffic was redistributed to account for new transportation facilities now under construction (e.g., completion of the King Street ramps to I-280, extension of Fifth Street between King and Berry Streets).

Source: EIP Associates.

to/from the ballpark parking locations on days when a ballgame or special event was held at the ballpark. The cumulative plus-project L_{dn} noise levels would increase 0.3 dBA to 1.8 dBA at the residential sites analyzed. The one-hour L_{eq} at the non-residential sites studied would increase 1.0 to 5.5 dBA in 2015 with cumulative-plus-project traffic on game days.

Ballpark traffic plus cumulative traffic in 2015 would cause noise levels to increase by up to 5.5 dBA at St. Gregory's Episcopal Church and other sensitive uses on Mariposa at De Haro Street before weekday night games (6:30 - 7:30 p.m.). As for the project traffic alone, this change would be noticeable to most people and annoying to some.

UCSF/Mission Bay Cumulative Scenario (Year 2015) Traffic Noise

As described in the Transportation Impact analysis methodology discussion, pp. IV.108 - IV.109, a second cumulative growth scenario was analyzed including the new major campus under consideration by the University of California at San Francisco (UCSF) in the southern portion of the Mission Bay planning area, plus additional development by Catellus Development Corporation in the Mission Bay South of Channel area (see IV.E. Transportation and Circulation, pp. IV.108 - IV.110 for more detail on the assumptions used to develop this second cumulative scenario). Traffic increases that would result from the additional growth under this cumulative scenario, plus the ballpark traffic, would not be large enough to produce perceptible noise increases in the portion of the project traffic study area north of China Basin Channel compared to those shown for the "base" cumulative described above.

However, traffic noise modeling, using the methodologies and assumptions described earlier in this section, shows that with UCSF/Mission Bay cumulative growth noise levels would increase perceptibly in the Mariposa Street corridor. At St. Gregory's Episcopal Church, near the Mariposa Street intersection with De Haro Street, the one-hour L_{eq} would increase an additional 3.7 dBA during the hour before a weekday night baseball game, to 74.3 dBA, due to UCSF/Mission Bay cumulative traffic growth combined with ballpark traffic. This is

compared with a one-hour L_{eq} of 70.6 dBA outside the church in the "base" cumulative-plus-project analysis, and with the existing one-hour L_{eq} of 65.1 dBA (see Table IV.F.2, p. IV.249). If the UCSF/Mission Bay cumulative-plus-project traffic noise increase were to occur over a short period of time, the projected change of 9.2 dBA would be perceived as a nearly doubling of loudness in the Mariposa and De Haro Streets area. If traffic increases of the magnitude estimated for this UCSF/Mission Bay cumulative scenario were to occur, they would be gradual changes over ten or more years.

Residential uses along Mariposa Street west of De Haro Street would experience a gradual increase in the 24-hour average noise levels of up to 8.2 dBA over time, from 67.6 dBA L_{dn} in the existing situation to about 75.8 dBA with the UCSF/Mission Bay cumulative scenario on days when ballpark traffic used Mariposa Street. Ballpark traffic would contribute about 0.5 dBA to this overall change.

Because the increase in traffic noise would be perceived as a near doubling of loudness, this traffic noise increase from cumulative development in the UCSF/Mission Bay scenario, including ballpark traffic, would be a cumulative significant environmental impact.

BALLGAME CROWD NOISE IMPACTS

Table IV.F.3 summarizes the existing and crowd noise levels at the three residential receptors where long-term noise measurements were taken and at four additional existing or proposed residential receptors where existing noise levels were estimated by the ENM computer model. Figure IV.F.2, p. IV.253 shows these analysis locations. Crowd noise (hourly L_{eq}) was calculated with the ENM computer model and combined with the existing weekend or evening hourly L_{eq}.

Location A is in a residential neighborhood on Potrero Hill; Location B is at the San Francisco Recreational Vehicle Park; and Location C is at the South Beach Marina

TABLE IV.F.3
PROJECTED CROWD NOISE LEVELS FROM PROPOSED BALLPARK
L_{eq} (hourly average)

	Location[3]	Existing Weekend or Evening Hourly L_{eq}	Project Noise Level [1] (dBA)		Project & Existing Noise Level (dBA)[2]	
			Hourly L_{eq}	Maximum Level	Hourly L_{eq}	Change From Existing Hourly L_{eq}
A	Potrero Hill, Residential at Texas & 19th Streets	55	34	45	55	0
B	Townsend & Clyde, San Francisco RV Park	66	48	59	66	0
C	Townsend & Colin P. Kelly Jr. Streets, South Beach Marina Apartments	62	52	63	62	0
D	North of South Beach Marina Apartments	57	44	55	57	0
Ea[4]	Apartments North of King Street and East of Colin P. Kelly Jr. Street (ground, mid-, and top levels)	65	55	66	65	0
Eb[4]		65	57	68	66	1
Ec[4]		65	59	70	66	1
Fa[1]	Approved Apartments North of King Street and East of 2nd Street (ground, mid-, and top levels)	65[5]	53	64	65[6]	0[7]
Fb[1]		63[5]	54	65	64[6]	1[7]
Fc[1]		60[5]	60	71	63[6]	3[7]
Ga[1]	Proposed Apartments between King and Berry Streets East of 4th Street (ground, mid-, and top levels)	62[5]	45	56	62[6]	4[7]
Gb[1]		60[5]	46	57	60[6]	0[7]
Gc[1]		57[5]	49	60	58[6]	4[7]

Notes:
1. "Project" noise is the one-hour and maximum crowd noise from the ballpark alone, calculated as though there were no other nearby noise sources. "Maximum level" is crowd cheers or shouts.
2. Note that dB are not added by conventional arithmetic so the project at 34 dBA plus existing at 55 dBA does not equal 89 dBA.
3. See Figure IV.F.2, p. IV.253, for a map of locations.
4. "a" is approximately ground floor, "b" is mid-level, and "c" is top floors of each multi-unit residential building.
5. Estimated existing ambient noise levels.
6. Sum of project and estimated existing ambient noise energy.
7. Relative to estimated existing ambient noise level.

Source: Wilson, Ihrig & Associates, Inc., *San Francisco Pacific Bell Park at China Basin Acoustical Analysis of Impacts from Stadium Noise*, February 1997.

SOURCE: EIP Associates

GIANTS BALLPARK

● Figure IV.F.2 Crowd and Concert Noise Analysis Locations

Apartments. Location D is also at the South Beach Marina Apartments, but on the side of the building not facing the ballpark. Location E is at another existing multi-story apartment building north of King Street and east of Colin P. Kelly Jr. Street. Location F is at the site of an approved apartment building north of King Street and east of Second Street that will be under construction in summer 1997. Location G is at the site of a proposed multi-unit residential building between King and Berry Streets east of Fourth Street in the Mission Bay North of Channel area.

The maximum crowd noise (the noise level exceeded 1 percent of the time) from cheers and boos during a game expected from the ballpark is also shown in Table IV.F.3, p. IV.252, in the middle column, labeled "maximum level." It is about 11 decibels higher than the energy-averaged hourly level, based on data collected at 3Com Park. The hourly average noise levels shown in Table IV.F.3 are for a sellout crowd at the ballpark and provide a conservative analysis.

Sellout crowds are assumed to occur about 30 to 40 percent of the time or about 25 to 35 days per year (see IV.E. Transportation and Circulation, p. IV.89, Baseball Game Attendance). At most locations, the total hourly L_{eq} (i.e. the projected hourly crowd L_{eq} added to the existing hourly L_{eq}) shown as "Project Existing Noise Level, Hourly L_{eq}," would not differ substantially from the existing hourly L_{eq}. However, at Location F, the approved apartment building at Second and King Streets, the upper-story apartments with a direct view of the ballpark interior would experience a total hourly L_{eq} about 3 dBA higher than the existing hourly L_{eq}.

For short periods during a ballgame, the projected maximum crowd noise level from cheers and applause would be substantially higher than the existing hourly average ambient level at the upper floors of: the approved apartment building at Location F (King and Second Streets); the existing apartment building at Location E (King and Colin P. Kelly Jr. Streets); and the proposed apartment building at Location G (between King and Berry Streets east of Fourth Street). For example, the maximum crowd cheer at upper floors across from the

ballpark site (King and Second Streets) could be 71 dBA, compared to the existing hourly L_{eq} of 60 dBA. Thus, at these locations, the cheering noise from the fans should be very noticeable above the existing ambient noise when the listener is outdoors (on a deck) or has windows open, especially during lulls in the traffic.

The nature of crowd noise is different from the usual community noises, especially when the crowd cheers or boos. Therefore, crowd cheering noise would be heard by many in upper-level apartments in nearby buildings even though the maximum noise levels would not change very much. Some sites on Potrero Hill or in the South of Market or Rincon Point areas could occasionally detect crowd cheers during lulls in the existing traffic noise that most residents are accustomed to, although hourly average ambient noise levels would not change. Some listeners could find these cheering noises and crowd noise annoying; others might enjoy hearing occasional cheers from the ballpark. For this reason, and because of the duration and frequency of crowd noises, and the urban setting of the ballpark where residents and workers expect higher levels of noise, the introduction of crowd noise to the Rincon Point-South Beach area would not be considered a significant impact.

Crowd noise would be noticeable at South Beach Park and parts of the South Beach Harbor/Marina just northeast of the ballpark site, because the ballpark structure is not proposed to be as tall on this side as on other sides, although the restaurant building and scoreboard would reduce some noise transmission. Similarly, crowd noise would be noticeable across China Basin Channel in the area east of Third Street that is designated for open space in the *Mission Bay Specific Plan*, (the area proposed for dedicated ballpark parking on a temporary basis).

The ballpark design includes use of plastic or wooden seats; this would avoid unnecessary noise due to fans banging on the seats, as now occurs at 3Com Park in the area with aluminum bleachers. The seating area structure would be constructed of concrete, which would also reduce noise radiated by the ballpark structure.

An additional source of noise would be from the fans leaving the ballpark after a game. The impact would be greatest after a sold-out night game, around 10:30 or 11:00 p.m., when many nearby residents would be asleep. Pedestrians would be noisy as they walked from the ballpark to transit stops, or to parking garages or lots in the area near the ballpark. Motorists leaving garages and parking lots might blow their horns, adding to localized noise. These kinds of noisy activities could last for one half hour or more following a night ballgame. As crowds thinned out further from the ballpark, these kinds of effects would diminish.

Small planes towing advertising banners, similar to those that now fly over 3Com Park and other similar sites, would be an additional, new source of noise in the area of the ballpark during baseball games and other main events. The San Francisco Noise Ordinance does not address noise from advertising planes, and the project sponsor has no direct control over advertising flights. Unless such flights impinge on an airport safety zone, or their concentration constitutes a temporary air traffic safety hazard, the Federal Aviation Administration control towers at San Francisco and Oakland Airports do not limit them. These general aviation planes produce a different type of sound from the ambient noise in the area, which is generally dominated by traffic noise. Small plane overflights would be noticeable to many residents and others in the area, and would be annoying to some. Information from a report on noise monitoring results at Coors Field in Denver indicates that the increase in the hourly L_{eq} due to aircraft noise alone would be less than 3 dB.[14] Because small planes would only be in the area for a few hours, and only before and during ballgames, the additional noise is considered a temporary nuisance rather than a significant environmental impact.

CONCERT NOISE IMPACTS

Two concert scenarios at the proposed ballpark were considered: the first, a rock concert (special event) with a capacity crowd of up to 50,000; the second, a smaller concert with about 10,000 in attendance, seated in a portion of the ballpark with a stage located at the pitcher's mound and a fabric canopy over the infield area.

Full Capacity, Open Air Concert

Table IV.F.4 summarizes the existing ambient hourly L_{eq} noise levels, the projected hourly L_{eq} and maximum noise levels for the rock concert, and the summation of the projected hourly L_{eq} with the existing ambient hourly L_{eq}, at locations A through G. The concert noise data in the table shows noise levels due solely to music and those due to music and crowd noise combined.

In general, the maximum crowd-cheering noise level would be higher than the maximum music level (shown in "Max Level" columns), but the hourly crowd L_{eq} would be much less than the hourly music L_{eq}. Thus, music would be the dominant influence on the noise environment, with occasional interruption by crowd cheers.

The total hourly L_{eq}, with music and crowd cheering added to existing ambient, are typically 1 or 2 decibels higher than the existing ambient at Locations A through G. At the upper floors of the proposed apartment building north of King Street and east of Second Street (Location F) the noise increase would be up to 7 decibels, due largely to music. At the upper floors of the South Beach Marina Apartments at Townsend and Colin P. Kelly Jr. Streets (Location C), the exterior noise level would be about 65 dBA L_{eq}, about 8 decibels above the existing ambient noise level of 57 dBA. This increase would be due mainly to music sound.

The projected maximum music noise levels are, for most locations, similar to or somewhat greater than the existing ambient levels. Music noise has a different quality than traffic noise and other common urban sounds. Thus, music would be audible at all locations considered, except perhaps, at Potrero Hill (Location A). Even here though, the projected maximum music noise level is only two decibels less than the existing L_{eq} and snatches of music should be briefly perceptible during lulls in traffic. At the upper levels of the approved apartment building north of King and east of Second Street (Location F), the music noise at occasional maximum levels of 70 dBA (10 dBA above ambient) would be distinctly audible, especially during lulls in traffic on King Street. The difference between the maximum sound levels and the hourly L_{eq} for music, crowd, and music and crowd, would vary, depending on the type of music and the crowd response to it.

TABLE IV.F.4 ●
PROJECTED CONCERT NOISE LEVELS
FOR FULL CAPACITY, OPEN-AIR EVENTS

	Location[3]	Existing Weekend or Evening Hourly L_{eq}	Project Music[1] Noise Level (dBA)		Music Plus[1] Crowd Noise (dBA)		Total Noise[2] (dBA)	
			Hourly L_{eq}	Max Level	Hourly L_{eq}	Max Level	Hourly L_{eq}	Change in Hourly L_{eq}
A	Potrero Hill, Residential at Texas & 19th Streets	55	47	53	47	54	56	1
B	Townsend & Clyde, San Francisco RV Park	66	54	60	55	63	66	0
Ca[4]	Townsend & Colin P. Kelly Jr. Streets, South Beach Marina Apartments	62	61	67	62	68	65	3
Cc[4]		57	63	69	64	72	65	8
D	North of South Beach Marina Apartments	57	51	57	52	59	58	1
Ea[4]	Apartments North of King Street and East of Colin P. Kelly Jr. Street (ground, mid-, and top levels)	65	59	65	60	69	66	1
Eb[4]		65	60	66	62	70	67	2
Ec[4]		65	60	66	63	71	67	2
Fa[4]	Approved Apartments North of King Street and East of 2nd Street (ground, mid-, and top levels)	65[5]	64	70	64	71	68[6]	3[7]
Fb[4]		63[5]	64	70	64	71	67[6]	4[7]
Fc[4]		60[5]	64	70	66	74	67[6]	7[7]
Ga[4]	Proposed Apartments between King and Berry Streets East of 4th Street (ground, mid-, and top levels)	62[5]	53	59	54	61	63[6]	1[7]
Gb[4]		60[5]	53	59	54	61	61[6]	1[7]
Gc[4]		57[5]	53	59	54	63	59[6]	2[7]
Ia[4,8]	Mission Bay South between 3rd and 4th Streets	63	69	75	69	75	70	7
Ib[4]		63	75	81	75	81	75	12
Ja[4]	Mission Bay South Terry Francois Blvd.	60	66	72	67	74	68	8
Jb[4]		60	71	77	71	78	72	12
La[4]	South Edge Steamboat Pt. Apts, King St. Side	65	77	83	77	83	77	12
Lb[4]		65	82	88	82	88	82	17

Notes:

1. "Project Music Noise" and "Music plus Crowd Noise" calculate noise from concert music alone and for noise from music and the audience alone, without regard to any surrounding noise sources. "Maximum Level" is the maximum cheer or applause.
2. Total noise adds music L_{eq} plus crowd noise L_{eq} to existing ambient noise. Note that dB cannot be added together using conventional arithmetic.
3. See Figure IV.F.2, p. IV.253, for a map of locations.
4. "a" is approximately ground floor, "b" is mid-level, and "c" is top floors of each multi-unit residential building.
5. Estimated existing ambient noise levels.
6. Sum of project and estimated existing ambient noise energy.
7. Relative to estimated existing ambient noise level.
8. Location H, in South Beach Park and Marina, is discussed in the text but has not been included in the table.

Source: Wilson, Ihrig & Associates, Inc., *San Francisco Pacific Bell Park at China Basin Acoustical Analysis of Impacts from Stadium Noise*, February 1997.

Music would be quite noticeable at South Beach Park and South Beach Harbor adjacent to the ballpark. Noise levels could increase by about 7 dBA L_{eq} at the harbor walk area near the ballpark (see Figure IV.F.2, p. IV.253, site Ha), and by about 12 dBA L_{eq} in South Beach Park (site Hb) and about 10 dBA L_{eq} in the mid-harbor area (site Hc). While the occasional large music event (special event) might discourage some from using the park, others may choose to come to the park during a concert to hear some of the music even though the ballpark structure would block some of the sound. Similarly, concert music would be noticeable across China Basin Channel in the area shown for open space use in the *Mission Bay Specific Plan.*

In summary, concert and crowd noise from large music events would be noticeable and could be annoying to residents living in apartment buildings near the ballpark. Some residents might find it difficult to sleep or might have their sleep disturbed as a result of a large music event (see Mitigation Measures for Concert Noise in V.C. Noise Mitigation Measures, p. V.61).

Partial Capacity Concert, With Fabric Canopy

A smaller event with an attendance of about 10,000 persons would not be as loud as the full-capacity rock concert event. Table IV.F.5 summarizes the noise levels for the smaller concert event at the same Locations A through G identified above. Concert noise (hourly L_{eq}) was calculated with the ENM model and added to the existing weekend or evening hourly L_{eq} values. Projected noise levels, both the hourly L_{eq} and the short-term maxima (e.g., noise levels maintained for a few seconds during musical crescendos, applause, etc.), are given for two conditions: music only and music plus crowd noise.

The hourly L_{eq} due to music and crowd noise at most of the locations modeled would be substantially less than the existing ambient noise levels. When music and crowd noise is added to existing ambient noise levels, the total L_{eq} is about the same as the existing ambient for most locations. Thus, existing background noise generally would be louder than music and crowd noise. The top floor of the approved apartment building north of King Street and east of Second Street (Location F) is the only place where there would be an increase, about one decibel, when

TABLE IV.F.5 ●
PROJECTED CONCERT NOISE LEVELS
FOR PARTIAL CAPACITY, CANOPIED EVENTS

	Location[3]	Existing Weekend or Evening Hourly L_{eq}	Project Music[1] Noise Level (dBA)		Music Plus[1] Crowd Noise (dBA)		Total Noise[2] (dBA)	
			Hourly L_{eq}	Max Level	Hourly L_{eq}	Max Level	Hourly L_{eq}	Change in Hourly L_{eq}
A	Potrero Hill, Residential at Texas & 19th Streets	55	47	53	47	54	56	1
B	Townsend & Clyde, San Francisco RV Park	66	54	60	55	63	66	0
Ca[4]	Townsend & Colin P. Kelly Jr. Streets, South Beach Marina Apartments	62	61	67	62	68	65	3
Cc[4]		57	50	60	54	64	59	2
D	North of South Beach Marina Apartments	57	51	57	52	59	58	1
Ea[4]	Apartments North of King Street and East of Colin P. Kelly Jr. Street (ground, mid-, and top levels)	65	59	65	60	69	66	1
Eb[4]		65	60	66	62	70	67	2
Ec[4]		65	60	66	63	71	67	2
Fa[4]	Approved Apartments North of King Street and East of 2nd Street (ground, mid-, and top levels)	65[5]	64	70	64	71	68[6]	3[7]
Fb[4]		63[5]	64	70	64	71	67[6]	4[7]
Fc[4]		60[5]	64	70	65	74	67[6]	7[7]
Ga[4]	Proposed Apartments between King and Berry Streets East of 4th Street (ground, mid-, and top levels)	62[5]	53	59	54	61	63[6]	1[7]
Gb[4]		60[5]	53	59	54	61	61[6]	1[7]
Gc[4]		57[5]	53	59	54	63	59[6]	2[7]
Ia[4,8]	Mission Bay South between 3rd and 4th Streets	63	69	75	69	75	70	7
Ib[4]		63	75	81	75	81	75	12
Ja[4]	Mission Bay South Terry Francois Blvd.	60	66	72	67	74	68	8
Jb[4]		60	71	77	71	78	72	12
La[4]	South Edge Steamboat Pt. Apts, King St. Side	65	77	83	77	83	77	12
Lb[4]		65	82	88	82	88	82	17

Notes:

1. "Project Music Noise" and "Music plus Crowd Noise" calculate noise from concert music alone and for noise from music and the audience alone, without regard to any surrounding noise sources. "Maximum Level" is the maximum cheer or applause.
2. Total noise adds music L_{eq} plus crowd noise L_{eq} to existing ambient noise. Note that dB cannot be added together using conventional arithmetic.
3. See Figure IV.F.2, p. IV.253, for a map of locations.
4. "a" is approximately ground floor, "b" is mid-level, and "c" is top floors of each multi-unit residential building.
5. Estimated existing ambient noise levels.
6. Sum of project and estimated existing ambient noise energy.
7. Relative to estimated existing ambient noise level.
8. Location H, in South Beach Park and Marina, is discussed in the text but has not been included in the table.

Source: Wilson, Ihrig & Associates, Inc., *San Francisco Pacific Bell Park at China Basin Acoustical Analysis of Impacts from Stadium Noise*, February 1997.

music and crowd noise is added to existing noise levels. At locations across the China Basin Channel from the ballpark, in the Mission Bay planning area at sites where existing or planned new buildings would not block sound, noise increases of 0 to 1 dBA could occur, similar to those shown for Location F. Occasional cheers or applause might be noticeable at upper floors of other nearby apartment buildings with windows open.

At Potrero Hill (Location A), the maximum music level for a small event would be 22 decibels less than the existing L_{eq} and so would not likely be perceptible. At other locations, the maximum music levels would be less than the existing ambient, though the music may be perceptible during lulls in traffic. The combined music and crowd noise levels are noticeably higher than those for music alone. Even so, the combined maximum music and crowd noise levels would be less than the existing L_{eq} at almost all locations, except at the top floor of the approved apartment building north of King Street and east of Second Street (Location F), where the combined maximum level would be roughly 6 decibels higher than the existing ambient L_{eq}, and at the top floor of the existing South Beach Marina Apartments (Location C) where the combined maximum level would be about 7 decibels higher than existing. During lulls in traffic, the combined crowd and music noise should be detectible at locations other than Potrero Hill. At the southern-most portion of the Steamboat Point Apartments, on King Street nearest the ballpark site, analysis shows that a large concert event would increase ambient noise levels by 12 to 17 dBA L_{eq}. This large increase is predicted based on assumptions that the concert speakers would be mounted up to 30 ft. high and located in centerfield; this location would mean that speakers would be on about the same level as the top of the ballpark bleachers and that sound could travel directly toward the upper (third) floor of the King Street apartments with less shielding from the ballpark structure than is available at other nearby residential locations.

IMPROVEMENT MEASURE

The following improvement measure has been identified to address impacts of the project that would be less than significant.

To reduce traffic noise levels along Mariposa Street, a Parking Control Officer could be stationed at Mariposa and Vermont Streets near the U.S. 101 off-ramp to direct ballpark traffic down Vermont Street to Sixteenth Street (a non-residential area).

CONSTRUCTION NOISE

Project construction would take about 24 to 27 months and would temporarily increase noise levels in surrounding areas. Construction noise levels would fluctuate, depending on the

construction phase, equipment type and duration of use, and distance between the noise source and the listener. At 50 feet from the activity, typical construction equipment and activity causes average noise levels of 75 to 90 dBA. Interior noise levels would be about 10 to 15 dBA less at the same distance. Noise levels drop with distance from the source. No receptors are within 50 feet of the ballpark site. The closest receptors are over 200 feet from the perimeter of the ballpark site; this distance would result in a 6 dBA decrease in construction noise. Thus, interior noise levels at a site 200 feet from the ballpark site would range from about 55 to 70 dBA. Construction noise is regulated by the *San Francisco Noise Ordinance* (Article 29 of the *San Francisco Police Code*). The ordinance requires that sound levels from construction equipment other than impact tools not exceed 80 dBA at a distance of 100 feet from the noise source. Impact tools (jackhammers, piledrivers) must have both intake and exhaust muffled to the satisfaction of the Director of Public Works. Section 2908 of the Ordinance prohibits construction work at night, from 8:00 p.m. to 7:00 a.m., if noise would exceed the ambient noise level by five dBA at the project property line, unless a special permit is authorized by the Director of Public Works.

Pile driving would be required for the ballpark foundation. The noise level from pile driving would exceed 85 dBA, about 15 dBA over the ambient noise in the project site vicinity, at the closest residential receptors (within 250 feet of the project site boundary). Noise levels at other nearby residential sites would be less, based on additional distance from the project site. At noise levels of 85 dBA, normal conversation is extremely difficult, and sleep is impossible for most people. Intermittent noises such as pile-driving noise are more disturbing to many people.

Pile driving would occur during weekdays and occasionally on weekends for about five or six months, depending on the length of time each day that pile-driving was carried out and on the difficulty of driving each pile.

NOTES - Noise

1. The Environmental Noise Model is a comprehensive, commercially available computer model developed by RTA Software Pty, Ltd., Sidney, Australia, for predicting community noise.

2. Crowd and concert noise analyses are described in more detail in Wilson, Ihrig & Associates, *San Francisco Pacific Bell Park at China Basin, Acoustical Analysis of Impact from Stadium Noise,* February 1997.*

3. The temperature was 55 to 57°F and the reported humidity at nearby San Francisco International Airport was 88 to 94%. The wind speed was approximately 5 to 10 mph with gusts up to 20 mph, blowing from the southwest.

4. The two locations were in section 32 seat G5 on the west side of the stadium near left field; and in section 43 seat G5 on the east side of the stadium near right field. Fans were not allowed to sit near these sections. The speakers in these areas were also turned off, so that the measurements would not be influenced by nearby sources.

5. This location was about 1,600 feet from the center of the stadium.

6. This location was about 1,500 feet from the center of the stadium.

7. Wrightson, Johnson, Haddon & Williams, memorandum, June 10, 1996.

8. Measurements at 3Com Park did include noise from large commercial aircraft. This kind of noise was not factored into the noise model because it is not related to ballpark activities, and would not change as a result of moving baseball activities to a new location. Insofar as large jets fly over the China Basin area they would have been included in various measurements made in the area described in III.F. Noise setting.

9. Smith, Fause & McDonald, Inc., *Shoreline Amphitheater Sound Propagation Testing,* November 1992.*

10. Cavanaugh and Cann, *Control and Management of Outdoor Concert Sound - Review of Experience in North America*, August 1996.*

11. Noise levels at Shoreline are limited to about 98 dBA at the top of the amphitheater bowl; the level at about 150 feet from the main stage speakers is about 110 dBA. Wilson, Ihrig & Associates, *San Francisco Pacific Bell Park at China Basin, Acoustical Analysis of Impact from Stadium Noise,* February 1997.*

12. It has been shown in studies at Shoreline Amphitheater that temperature inversions (a layer of warmer air above the site with cooler air at ground level and above the warm layer) help to refract or bend sound from above an outdoor site to receptors some distance away. Those types of localized inversions are not common on the Bay in San Francisco, but are more common in the South Bay.

13. Wilson, Ihrig & Associates, Inc. *San Francisco Pacific Bell Park at China Basin Acoustical Analysis of Impact from Stadium Noise*, February 1997, p. 28.

14. Wilson, Ihrig & Associates, Inc., letter to EIP Associates, March 4, 1997, citing *Community Noise Monitoring Program, Coors Field, Denver, Colorado*, prepared by Hellmuth, Obata, and Kassabaum, Inc. Sports Facilities Group, August 1995.*

* A copy of this report is on file for review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

G. AIR QUALITY

REGIONAL VEHICULAR AIR POLLUTANT EMISSIONS

Methodology

Regional air quality impacts are caused by vehicular emissions of reactive organic compounds (ROG) and nitrogen oxides (NO_x), which are precursors of ozone pollution.

Project-caused motor vehicle pollutant emissions were calculated using the URBEMIS5 model[1] initialized to be consistent with the following data supplied by the project transportation consultant: 1) daily person trip volumes, 2) daily person trip origins/ destinations (e.g., San Francisco, other Bay Area counties, downtown workers, etc.), 3) person trip modes (by auto, rail, bus, etc.), 4) motor vehicle occupancy rates, and 5) average travel speed on streets in the project site vicinity. Estimates were made for both the proposed ballpark and 3Com Park in the years 2000 and 2015.

The methodology is sensitive to the established tendency for motor vehicles to emit more pollutants just after start-up (i.e., the "cold start" mode, before the catalytic converter has warmed up to its effective operating temperature) and at slow travel speeds, as would be the case with the substantial traffic congestion expected under game conditions in the project site vicinity. All motor vehicles coming to a ballgame were assumed to exhibit the regional average cold start profile (60 percent of the total are cold start at the beginning of their trips[2]), to travel at the regional average speed of 25 miles per hour[3] during most of the inbound trip length, and to operate with warmed catalytic converters during the last 2 miles of their trip, where their speed would slow to the site vicinity average. This behavior would, for the most part, be repeated for the return trip, the only difference being that 100 percent of the game attendees' vehicles would operate in the cold start mode, the catalytic converter having cooled during the game.

Emissions were estimated only for weekday afternoon game conditions because ballgame-related vehicular ROG and NO_x emissions would have their greatest impact then on regional ozone levels, which are highest on warm summer afternoons. This time also would be close to the PM peak hour commute when areawide contributions to regional ozone levels are greatest. Therefore use of weekday afternoon game conditions provides a conservative analysis.

By the year 2000, the state-average vehicular ROG and NO_x emissions per mile traveled are anticipated to decrease by about 40 percent and 25 percent, respectively, relative to the 1996 emission rates, according to the latest EMFAC7F1.1 model developed by the CARB. By the year 2015, the state-average vehicular ROG and NO_x emissions per mile traveled are anticipated to decrease by about 70 percent and 40 percent, respectively, relative to the 1996 emission rates. No significant change is expected for the PM_{10} emission rate, relative to 1996, in either year (more detail on PM_{10} analysis methods is available in Appendix E, Air Quality, pp. A.144 - A.145).

The Bay Area Air Quality Management District (BAAQMD) considers total net new project air pollutant emissions of ROG, NO_x and fine particulates (PM_{10}) to be significant if they equal or exceed 80 pounds per day (lb/day).[4]

Project-Caused Regional Emissions

At present, a ballgame at 3Com Park with an average crowd of 24,000 would generate about 17,600 vehicular trips with an average trip length of 27.8 miles (about 488,600 vehicle miles traveled [VMT]). The proposed ballpark with a capacity crowd of 39,500 would generate about 18,400 vehicular trips with an average trip length of 25.2 miles (about 463,200 VMT). The other proposed project land uses would generate about 4,400 vehicular trips with an average trip length of 6.4 miles (about 28,200 VMT). The proposed project's vehicular pollutant emissions are compared with those from an average game at 3Com Park in order to

determine the net change (increase or decrease) in emissions. If an analysis were to be done of a sellout game at 3Com Park to compare with sellout games at the new ballpark, the net change would be substantially less, and for some pollutants would show a net improvement due to the amount of transit available at the China Basin site. Sellout games at 3Com Park are less frequent than are assumed for the new ballpark, so a conservative approach was used in the air emissions analysis. The BAAQMD considers a net increase of 80 lb/day or more to be a significant air quality impact.

The URBEMIS5 model runs included the above-mentioned motor vehicle trip characteristics for 3Com Park, the proposed ballpark, and the other proposed land uses. The results are shown in Table IV.G.1, and are discussed below by analysis year.

The total vehicular emissions from the proposed ballpark and from the proposed ballpark in combination with the other proposed land use are shown in Figures IV.G.1 and IV.G.2, respectively, pp. IV.268 - IV.269, relative to emissions from 3Com Park, if the latter facility were to continue operating under current traffic conditions. The "other land uses," including retail, office and Pacific Bell Center uses in the Pavilion Building and restaurant uses on the waterfront side of the ballpark, are analyzed both separately on a non-game day, and together with the ballgame impacts. The totals assume an afternoon ballgame taking place but also include visitors and employees from the other land uses traveling in the same ways and in the same numbers as though there were no ballgame. These totals for ROG, NO_x, and PM_{10} emissions provide a conservative air quality impacts analysis because it is likely that many visitors to the retail and restaurant uses on a game day would be baseball fans whose vehicle trips (and therefore air pollutant emissions) are already included in the ballpark-related emissions calculations. Visitors who travel to these uses on a non-game day would be less likely to travel to the site to eat or shop when an afternoon ballgame is scheduled unless they were also going to the game. To the extent that the analysis double-counts some trips to the site, it provides a conservative approach that may slightly overstate impacts.

TABLE IV.G.1●
VEHICULAR AIR POLLUTANT EMISSIONS FROM THE PROPOSED BALLPARK AND OTHER PROJECT LAND USES COMPARED WITH 3COM PARK (LB/DAY)

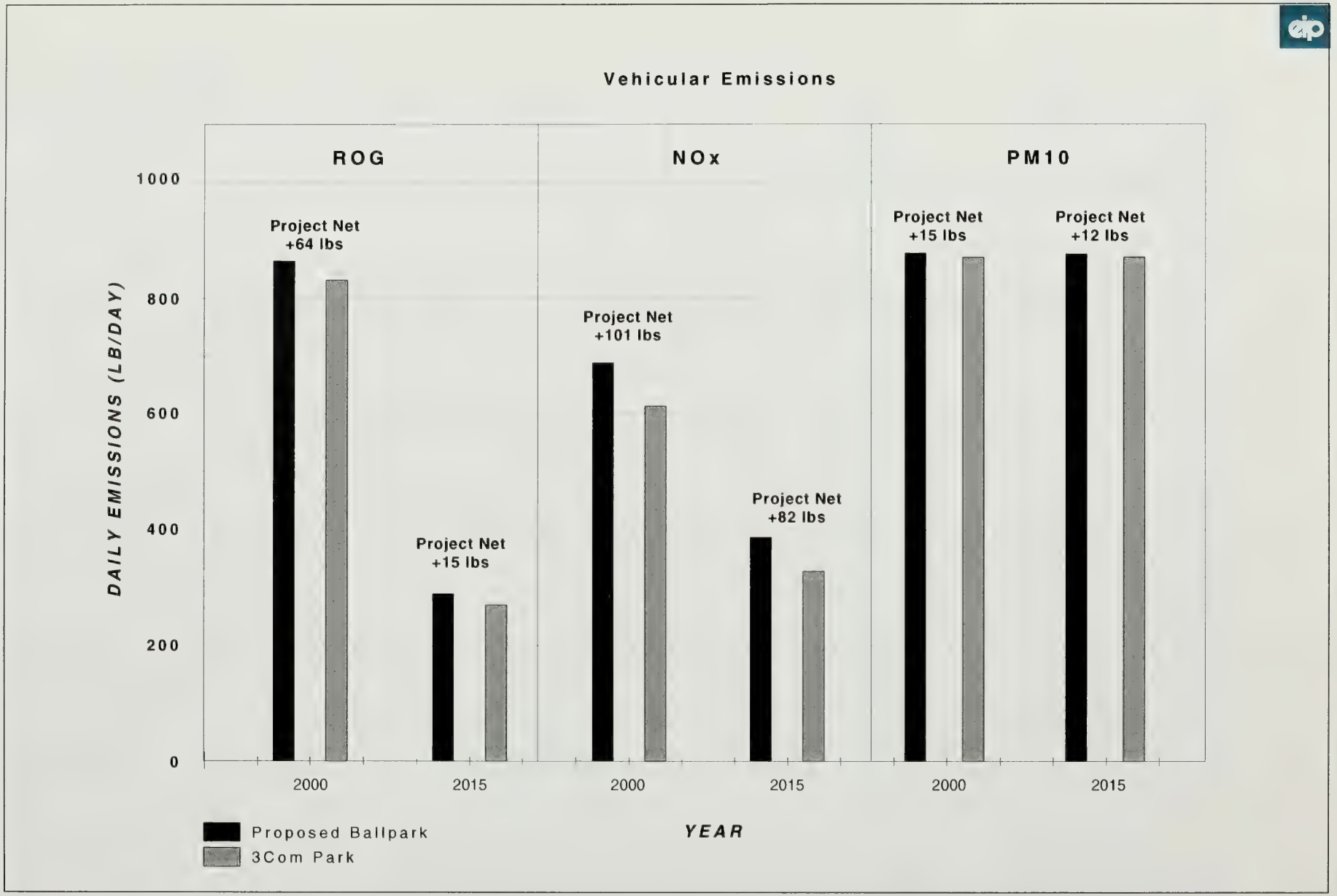
Source/Pollutant	Year 2000			Year 2015		
Ballpark	3Com Park	Project	Net Change	3Com Park	Project	Net Change
ROG	832	842	10	272	267	-5
NO_x	614	663	49	327	374	47
PM_{10}	868	834	-34	863	826	-37
Other Land Uses						
ROG	0	54	54	0	20	20
NO_x	0	52	52	0	33	33
PM_{10}	0	49	49	0	49	49
Total						
ROG	832	896	64	272	287	15
NO_x	614	715	**101**	327	407	**82**
PM_{10}	868	883	15	863	875	12

Notes:
Vehicular source emissions were calculated with URBEMIS5, a model developed by the CARB.
BAAQMD considers net new pollutant emissions over 80 lb/day to be a significant change.
Numbers in bold exceed the BAAQMD significance threshold

Source: EIP Associates.

Year 2000

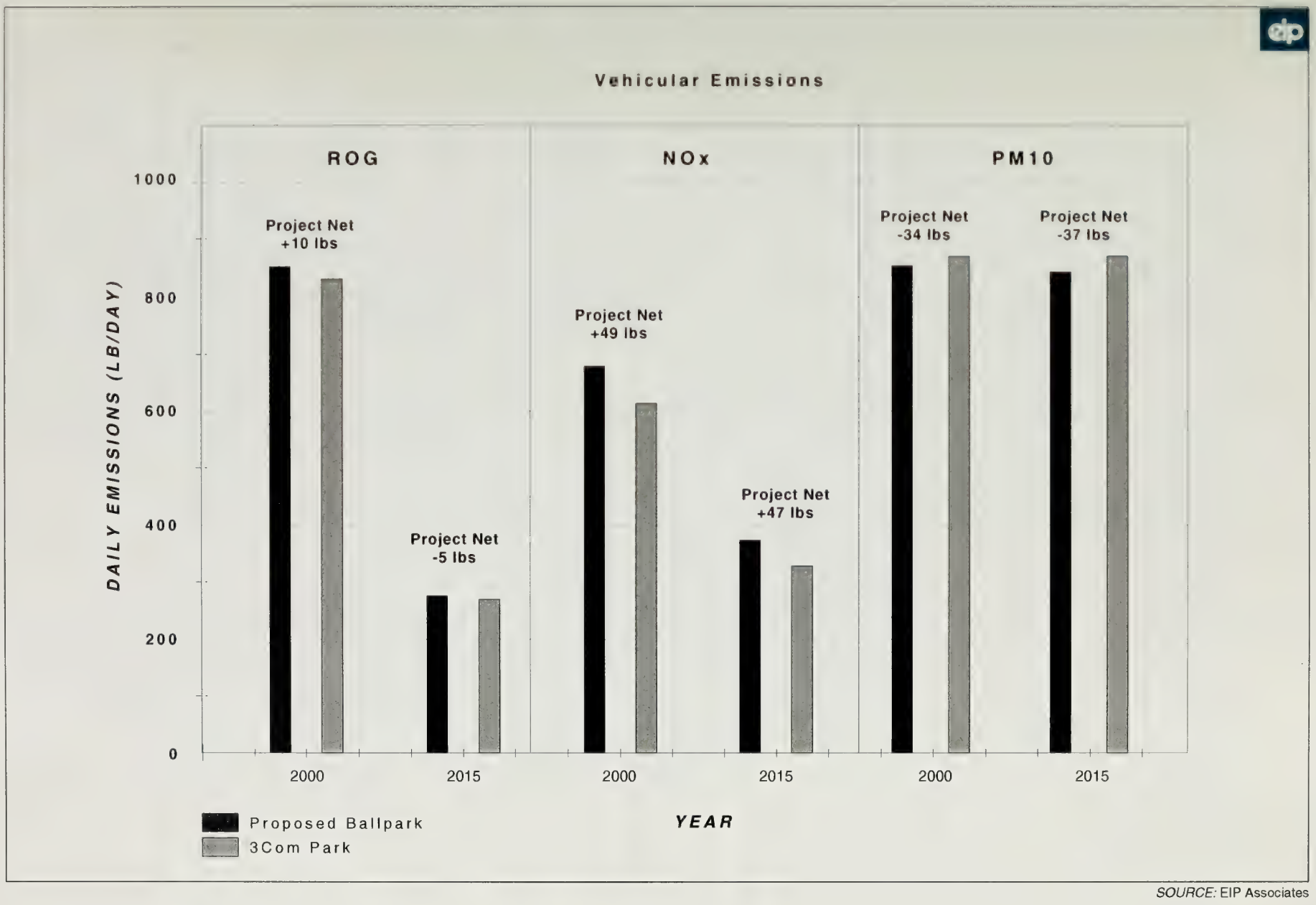
Vehicular ROG, NO_x, and PM_{10} emissions from an afternoon game at the proposed ballpark would amount to 842 lb., 663 lb., and 834 lb., respectively. Vehicular ROG, NO_x, and PM_{10} emissions from an afternoon game at 3Com Park would amount to 832 lb., 614 lb., and 868 lb., respectively, net changes of +10 lb., +49 lb., -34 lb., respectively, as shown in Table IV.G.1 and in Figure IV.G.1. The proposed ballpark would result in net increases of ROG and NO_x emissions because the number of vehicle trips would be about 5 percent greater than that generated by 3Com Park; the additional ROG and NO_x emissions produced



SOURCE: EIP Associates

GIANTS BALLPARK

Figure IV.G.1 Proposed Project Vehicular Emissions Compared to Existing 3Com Park Vehicular Emissions



SOURCE: EIP Associates

GIANTS BALLPARK

Figure IV.G.2 Proposed Project Vehicular Emissions (Without Commercial Uses) Compared to Existing 3Com Park Vehicular Emissions

during the cold start portion of the additional trips would override the benefit of shorter average trip lengths overall. But the proposed ballpark's vehicular ROG and NO_x emissions increments would not exceed the 80 lb/day BAAQMD threshold. In contrast, the proposed ballpark would result in a net decrease of PM_{10} emissions because its VMT would be about 5 percent less than that generated by 3Com Park; unlike ROG and NO_x, there is no substantial increased PM_{10} emissions during the cold start portion of a trip.

Vehicular ROG, NO_x, and PM_{10} emissions from an afternoon game at the proposed ballpark plus the daily use of the other proposed land uses would amount to 896 lb., 715 lb., and 883 lb., respectively. Vehicular ROG, NO_x, and PM_{10} emissions from an afternoon game at 3Com Park would amount to 832 lb., 614 lb., and 868 lb., respectively. The new ballpark at China Basin would, therefore, cause net changes of +64 lb., +101 lb., +15 lb., respectively. The proposed ballpark would result in net increases of ROG, NO_x and PM_{10} emissions because both the number of vehicle trips and the VMT would be greater than that generated by 3Com Park. The proposed ballpark and other land uses' vehicular NO_x emission increment would exceed the 80 lb/day BAAQMD threshold.

Year 2015

Vehicular ROG, NO_x, and PM_{10} emissions from an afternoon game at the proposed ballpark would amount to 267 lb., 374 lb., and 826 lb., respectively. Vehicular ROG, NO_x, and PM_{10} emissions from an afternoon game at 3Com Park would amount to 272 lb., 327 lb., and 863 lb., respectively, net changes of -5 lb., +47 lb., -37 lb., respectively, as shown in Figure IV.G.1, p. IV.268. The proposed ballpark would result in net increases of NO_x emissions because the larger number of vehicle trips would override the NO_x emission improvements expected in the year 2015. But the proposed ballpark's vehicular NO_x emissions increment would not exceed the 80 lb/day BAAQMD threshold. In contrast, the proposed ballpark would result in a net decrease of ROG and PM_{10} emissions.

Vehicular ROG, NO_x, and PM_{10} emissions from an afternoon game at the proposed ballpark plus the daily use of the other proposed land uses would amount to 287 lb., 407 lb., and 875 lb., respectively (see Figure IV.G.2, p. IV.269). Vehicular ROG, NO_x, and PM_{10} emissions from an afternoon game at 3Com Park would amount to 272 lb., 327 lb., and 863 lb., respectively, net changes of +15 lb., +82 lb., +12 lb., respectively. The proposed ballpark would result in net increases of ROG, NO_x and PM_{10} emissions because both the number of vehicle trips and the VMT would be greater than that generated by 3Com Park. The proposed ballpark and other land uses' vehicular NO_x emission increment together would cause exceedance of the 80 lb/day BAAQMD threshold.

LOCAL CARBON MONOXIDE CONCENTRATIONS

Methodology

Caltrans' CALINE4 program was used to model local carbon monoxide (CO) impacts. The CALINE4 model was implemented according to the guidelines contained in *Transportation Project-Level Carbon Monoxide Protocol ("CO Protocol").*[5] Emission factors were derived using CT-EMFAC2.0, Caltrans' PC implementation of the California Air Resources Board's EMFAC7F1.1 mobile source emissions model. More detail on CO analyses methods is available in Appendix E, Air Quality, p. A.143 - A.144.

CO receptor locations were chosen to represent a combination of representative specific sensitive land uses in the project site vicinity (based on a visual survey of the area) and "worst-case" conditions near major intersections. Setbacks for the former category of receptors generally ranged from about 30 to 80 feet (ft.) from the centerline of the nearest major roadway; one of the sensitive receptors in South Park was set back 200 ft. from Third Street. The intersection receptors were sited according to *CO Protocol* recommendations: for one-hour CO levels, receptors were located at 5 meters (16 ft.) from the near edges of the nearest travel lanes; for eight-hour CO levels, at 7 meters (23 ft.) from the near edges of the

nearest travel lanes. At most of the modeled CO receptors, only the nearest surface streets were included because of their dominant influence on local CO levels. However, for several receptors, freeway ramps and/or mainline segments of freeways were also included as appropriate.

Traffic conditions specified in the following five traffic scenarios, as calculated by the project transportation consultants (see Transportation and Circulation Impacts, pp. IV.105 - IV.110, for a description of the two cumulative scenarios), were established for the local CO analysis:

- Existing (1996)
- Existing Redistributed (2000)
- Existing Redistributed + Project (2000)
- Cumulative + Project (2015)
- UCSF/Mission Bay Cumulative + Project (2015)

"Existing Redistributed" traffic conditions account for changes in the transportation and circulation system that are presently under construction, such as the King Street on/off ramps to/from Interstate 280 in the project study area and completion of King Boulevard with MUNI Metro tracks in the median. Both "Existing Redistributed" and "Existing Redistributed + Project" are shown as "year 2000" because the air quality analysis must establish a modeling year in order to choose the proper automobile emission factors for that year; 2000 is the earliest year that the project is expected to be in operation. Two future cumulative scenarios were analyzed for the year 2015, a "base" cumulative using growth in the City and region based on ABAG forecasts with adjustments for local proposals, and a second larger growth assumption including full development in the Mission Bay planning area with a major new campus for the University of California, San Francisco, including housing, office and light industrial uses.

Of the five hourly periods considered in the project transportation analysis, the following two were selected for CALINE4 modeling:

- Weekday 6:30 - 7:30 p.m. (peak arrival hour for weekday night game)
- Weekday 10:30 - 11:30 p.m. (peak departure hour for weekday night game)

Emphasis was placed on night game conditions because meteorological conditions tend to enhance local CO concentrations during evening and nighttime hours; therefore the analysis times chosen present the most conservative approach to calculating CO impacts.

Total CO concentrations were obtained by adding a regional background component to the local CO component estimated using the CALINE4 model. Background CO levels were obtained from the CO concentration isopleths (i.e., lines representing equal CO concentrations) and future year rollback factors presented in the *BAAQMD CEQA Guidelines*. Monthly maximum CO concentrations at air pollutant monitoring stations in San Francisco were examined to determine whether an adjustment to suggested BAAQMD methodology was warranted by the April through October baseball season. However, maximum one-hour CO concentrations occurring during this period typically approached or equaled maximum concentrations experienced over the entire year. Therefore, no adjustments were made to the initial CO background estimates.

The BAAQMD would consider local CO concentrations to be significant if they exceed state or federal ambient standards. Project or cumulative sources would contribute significantly to these impacts if they produce measurable (i.e., 1 ppm for one-hour averages, 0.5 ppm for eight-hour averages) increases in CO levels at places where CO standards would be exceeded.[6]

Localized Carbon Monoxide Emissions

CO levels were modeled, using the CALINE4 dispersion model, at selected sensitive land uses along the major roadways and at receptors located near selected busy intersections in the project site vicinity. CO levels were estimated for the base year of the traffic study (1996), for the earliest year the ballpark would be built (2000) and for cumulative buildout conditions (2015). One-hour and eight-hour average CO concentrations were estimated, as shown in Table IV.G.2.

Year 2000

Violations of the state one-hour and state/federal eight-hour CO standards are anticipated at almost all of the intersection receptors, the one exception being at Fourth and Townsend Streets. Three of the sensitive land use receptors also show violations of the state/federal eight-hour CO standards, specifically the school on Harrison Street west of Fourth Street, the residential use on Third Street north of South Park Drive, and the hotel at Bryant and Fourth Streets (the latter would violate the state one-hour CO standard as well). The project CO increments would be relatively large in comparison to the background and non-project local components because of the project-related traffic volume increases and the low vehicular travel speeds in the project site vicinity before and after ballgames.

Base Cumulative + Project, Year 2015

No violations of the state and/or federal CO standards are anticipated at any of the modeled receptors by 2015. Although there would continue to be large project-related traffic volume increases and low vehicular travel speeds in the project site vicinity before and after ballgames, their adverse effects on CO levels would be offset by the stringent vehicular CO emission controls expected to be implemented over the next 20 years.[7] One-hour and

TABLE IV.G.2
LOCAL CARBON MONOXIDE CONCENTRATIONS

Receptor	Nearest Roadway			One-Hour Concentration (ppm)[1]				Eight-Hour Concentration (ppm)[2]			
Type	Name	Segment	Modeled Hour	Existing	No Project (2000)	Project (2000)	Cumulative (2015)[3]	Existing	No Project (2000)	Project (2000)	Cumulative (2015)[3]
Residential	Folsom St.	E. of 4th St.	6:30 - 7:30 p.m.	10.1	10.5	11.7	7.5	7.7	8.1	8.3	5.4
School	Harrison St.	W. of 4th St.	6:30 - 7:30 p.m.	14.6	11.6	17.6	11.5	11.3	9.0	11.2	6.8
Hotel	Townsend St.	W. of Lusk St.	10:30 - 11:30 p.m.	8.7	7.2	9.3	6.0	7.5	6.1	6.5	4.3
Park/Residential	3rd St.	@ S. Park Dr.	10:30 - 11:30 p.m.	9.1	7.5	9.8	6.3	8.1	6.5	7.0	4.6
Residential	3rd St.	N. of S. Park Dr.	10:30 - 11:30 p.m.	10.5	8.6	17.6	8.7	10.0	8.0	9.7	5.9
Hotel	Bryant St.	W. of 4th St.	6:30 - 7:30 p.m.	12.6	9.9	20.7	14.5	9.7	7.6	9.6	7.0
	Intersection										
Intersection	3rd St./Bryant St.		10:30 - 11:30 p.m.	9.9	8.0	21.8	9.9	8.7	6.9	9.1	6.1
Intersection	3rd St./Townsend St.		10:30 - 11:30 p.m.	9.9	8.0	21.8	9.9	8.7	6.9	9.1	6.1
Intersection	4th St./Folsom St.		6:30 - 7:30 p.m.	14.6	14.3	24.6	15.7	10.6	10.3	11.7	8.1
Intersection	4th St./Harrison St.		6:30 - 7:30 p.m.	18.3	14.2	25.2	16.7	13.5	10.5	12.1	8.3
Intersection	4th St./Bryant St.		6:30 - 7:30 p.m.	14.2	10.2	22.3	14.2	9.6	7.6	9.6	6.6
Intersection	4th St./Townsend St.		6:30 - 7:30 p.m.	14.4	8.6	15.0	14.4	7.5	6.4	7.4	6.7

Notes:
1. The state one-hour standard is 20 ppm; the federal one-hour standard is 35 ppm.
2. The state and federal eight-hour standard is 9 ppm.
3. Additional 2015 cumulative analysis, using the UCSF/Mission Bay cumulative growth scenario with the project, identified no new violations of state or federal standards.

□ = State standard exceeded

▣ = State and federal standard exceeded

eight-hour CO concentrations at all the sensitive land use receptors would decline from existing levels. The same would be true for the eight-hour CO concentrations at all the intersection receptors. The one-hour CO concentrations at most of the intersection receptors would increase, but the one-hour CO standards would not be exceeded.

UCSF/Mission Bay Cumulative + Project, Year 2015

This future cumulative growth scenario assumes that the area of Mission Bay south of China Basin Channel would fully develop by 2015 with a major new campus for the University of California, additional Service/Light Industrial/Research and Development uses, office space, housing, and retail and hotel uses.[8] This growth would add relatively little to localized, traffic-caused carbon monoxide emissions in the areas north of China Basin Channel. For example, the one-hour CO concentrations for year 2015 would increase by 0.2 ppm at Folsom Street west of Fourth Street with the UCSF/Mission Bay cumulative scenario and project traffic. At 7.7 ppm the CO levels at this location would remain well under the state and federal one-hour standard (see note 1 in Table IV.G.2, p. IV.275, for state and federal standards). Similarly, the eight-hour CO at this location would increase by 0.1 ppm and would not violate standards.

Additional CO modeling was carried out for receptors in the traffic study area located south of the China Basin Channel, where traffic volumes would increase more substantially as a result of the UCSF/Mission Bay cumulative scenario. In general, one-hour and eight-hour CO concentrations would decline by the year 2015, as explained above. The intersection of Mariposa and De Haro Streets was studied as a representative example of potential increases in traffic due to the substantial additional growth under this UCSF/Mission Bay cumulative scenario. In 2015, one-hour CO concentrations at this location would increase by 1.4 ppm, to 7.0 ppm, well below the state's stringent 20 ppm standard. The eight-hour CO concentration would increase by 0.8 ppm, to 4.8 ppm, also well under the federal/state standard of 9.0 ppm. Therefore, although the UCSF/Mission Bay cumulative scenario with

the project would cause greater increases in CO levels than would the project alone or the base cumulative-plus-project scenario, it would not cause new significant air quality impacts in the year 2015.

Air Quality Effects of Proposed Traffic Detour

The transportation mitigation discussion includes a proposed detour for non-ballpark traffic that would send cars from Third Street west to Seventh Street between King and Sixteenth Streets before and after ballgames if they were not driving to the ballpark or the dedicated ballpark parking south of China Basin Channel (see V.B. Transportation and Circulation, pp. V.6 - V.17). Localized carbon monoxide (CO) modeling was extended to include representative intersections that would carry increased traffic as a result of this detour. The same assumptions were used for this analysis as for the main CO impacts analysis, using the CALINE4 computer model and including analyzing evening traffic because meteorological conditions tend to enhance local CO concentrations at that time (see p. IV.273). Two intersections were analyzed for this detour scenario: The Embarcadero at Townsend Street and Seventh Street at Townsend Street. The analysis was done using year 2000 vehicular emissions.

At the intersection of The Embarcadero with Townsend Street, the additional detoured traffic would increase evening one-hour CO by 1.7 parts per million (ppm), from 8.2 ppm without the detour to 9.9 ppm with the detour. The eight-hour CO concentrations at this intersection would increase with the detour by 0.3 ppm, from 6.0 ppm without the detour to 6.3 ppm. Neither increase would cause any new violations of state or federal CO standards (20 ppm California and 35 ppm federal for one hour; 9.0 ppm for eight hour).

The Seventh and Townsend Streets intersection was not previously modeled in the project and project-plus-cumulative air quality analysis, as relatively little traffic was assumed to use Seventh Street to access the ballpark or ballpark-parking areas. With the detour in place, the

evening one-hour CO levels would be 13.7 ppm, well below federal and state standards. The eight-hour CO levels would be 9.9 ppm, which would violate the state and federal standard of 9.0 ppm, and would be considered by the Bay Area Air Quality Management District to be a significant environmental effect. While not modeled, the existing CO levels would not be expected to exceed CO standards because traffic volumes at this intersection would be substantially less.

In general, one-hour and eight-hour CO concentrations in the traffic study area in the year 2015 would decline from their year 2000 levels, as described on p. IV.276). Therefore, no violations of state and/or federal CO standards would be expected in the traffic study area by the year 2015.

DEMOLITION AND CONSTRUCTION AIR POLLUTANT EMISSIONS

The EIR analysis of project construction impacts follows BAAQMD recommendations in focusing effort on the development of effective and comprehensive PM_{10} control measures rather than the detailed quantification of emissions, primarily because the mitigation measures, if adopted, reduce temporary construction air quality impacts to insignificant levels.[9] The BAAQMD does not consider construction emissions of CO and ozone precursors significant because they have already been included in the District's regional planning inventories and are not expected to impede regional attainment or maintenance of air quality standards.

Demolition and excavation activities, construction vehicle travel on unpaved ground, and wind blowing over exposed earth surfaces would generate PM_{10}. Such emissions and the resultant ambient concentrations near construction sites would be very sensitive to local meteorology and topography, to variations in soil silt and moisture content, and to the intensity of equipment use. Such emissions could be as high as 51 lb/acre/day for each construction site (see Appendix E, Air Quality, pp. A.143 - A.145, for calculation of

construction-related PM_{10}): they could lead to violations of federal and state ambient PM_{10} standards at nearby sensitive receptors, particularly the existing and proposed residential uses north and west of the project site, unless a BAAQMD-approved program of mitigation measures were imposed.

As noted on p. IV.233 under Transportation, Construction Improvement Measures, a neighborhood construction coordinator could be appointed by the project sponsor to ensure implementation of dust control and other construction measures.

NOTES - Air Quality

1. The URBEMIS5 computer model was developed by the California Air Resources Board to calculate vehicular emissions associated with proposed land use development projects.

2. Bay Area Air Quality Management District, *Bay Area Air Quality Management District CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans*, April 1996, p. 32.

3. Bay Area Air Quality Management District, *Bay Area Air Quality Management District CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans*, April 1996, p. 32.

4. Bay Area Air Quality Management District, *Bay Area Air Quality Management District CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans*, April 1996, p. 15.

5. Caltrans, *Transportation Project-Level Carbon Monoxide Protocol*, August 1995.

6. Bay Area Air Quality Management District, *Bay Area Air Quality Management District CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans*, April 1996, p. 15.

7. The emission factors are developed assuming existing regulations that control automobile emissions (such as reformulated gasoline, exhaust pipe emissions controls and regular smog checks for cars) continue in force and that the number of old, polluting vehicles in the regional fleet declines over time as drivers replace old cars with new ones.

8. The UCSF/Mission Bay cumulative scenario is described in more detail in Transportation and Circulation Impacts sections. Traffic analyses were prepared for this second cumulative scenario and are described under "UCSF/Mission Bay Cumulative" subheadings at various locations in the Transportation and Circulation Impacts section.

9. Bay Area Air Quality Management District, *Bay Area Air Quality Management District CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans,* April 1996, p. 13.

H. SEISMICITY

REGULATORY COMPLIANCE

Construction of all facilities at the proposed ballpark site would be required to comply with the seismicity provisions of the San Francisco Building Code (see III.H. Seismicity, pp. III.138 - III.139). Chapters 16 and 16A of the Building Code deal with general design requirements for structural forces, including (but not limited to) regulations governing seismically resistant construction. The seismic safety portions of the Building Code pertain to the basic structure of a project, such as the foundation design and placement, the building design and construction, and certain non-structural issues, such as wall anchorage and special requirements for high-occupancy staircases. Other non-structural issues, such as the way in which equipment and materials are anchored or stored would be addressed by measures included in the project to ensure public safety, and would be developed by the project sponsor's civil engineer and space planner at the time the equipment is installed. The structural issues identified in the impacts described below are regulated by one or more of the provisions of the San Francisco Building Code. They are addressed in the Treadwell & Rollo evaluation of the site, which resulted in recommendations for the project design that met the standards of the Building Code. Although conformance with the provisions of the Building Code is required of all development projects in the City, discussion of the potential impacts and hazards regulated by them is included here to provide decision-makers with the seismicity context in which the regulations would be applied.

As described in III.A. Consistency with Existing Plans and Policies, p. III.1, the Port has jurisdiction over the portion of the project site south of Berry Street. If the Port's *Draft Waterfront Land Use Plan* is adopted, the site may be subject to measures in the plan related to seismic safety.

Strict enforcement of these seismic standards would be the minimum requirement for the ballpark. By adhering to the San Francisco Building Code standards, the project sponsor

would ensure that the new facilities would reduce the exposure to potentially damaging earthquake vibrations through seismic-resistant design based on the geotechnical conditions at the construction site and the maximum earthquake forces expected at the site. Seismic-restraint recommendations of the geotechnical report, used by the geotechnical and structural engineers responsible for construction of the project, would be incorporated in the design of the new ballpark to reduce the chance of injury during a major earthquake. To the extent foreseeable, the Treadwell & Rollo report has evaluated, and provided recommendations to reduce, the geotechnical hazards of the project site, as required by Life Safety Policy 4 of the *Community Safety Element*. Similarly, Proposed Life Safety Policies 2-1 and 2-3 to assure compliance with current structural and life safety standards, and to consider soil conditions in areas subject to liquefaction are addressed to the extent foreseeable by this investigation, as is the requirement for geotechnical evaluation and mitigation of the state's Seismic Hazards Mapping Act.

GROUNDSHAKING

Because of its proximity to known active faults and soft sediments underlying the site, the ballpark would be subject to seismically induced forces in excess of the standard ranges used in the Uniform Building Code (UBC) for designing seismic-resistant foundations and structures in other parts of California. UBC Seismic Zone 4 requires seismic-resistant designs to withstand horizontal ground accelerations of at least 0.4g (40 percent of the force of gravity). From the review of regional seismic conditions, it is probable that the area will be subjected to at least one major earthquake during the useful economic life of the ballpark. As discussed in III.H. Seismicity, p. III.134, the most severe earthquake expected is estimated to be a M_w 7.3 earthquake on the Hayward fault, which would create peak accelerations in excess of 0.5g throughout the Bay Area. Because the ballpark site is partially underlain by bedrock and partially by Bay Mud deposits, which respond differently to seismic vibrations, peak accelerations of about 0.6g would be expected, based on the site response models developed by Treadwell & Rollo during the dynamic analysis of the ballpark

site. However, if the source of the earthquake were within 10 miles of the ballpark (i.e., directly across the Bay), near-source conditions could increase peak accelerations to greater than 1g, depending on the responses of subsurface material at the site.[1] Without adequate seismic-restraints, the resulting vibration would cause damage to structural elements of the ballpark and its associated buildings and utility lines (primary effects) and could cause ground failures (liquefaction, lateral spreading) in the underlying fill and Bay Mud (secondary effects) which in turn, could endanger structures and their occupants.[2]

To reduce the potential effects of groundshaking, the ballpark and associated structures would be constructed on a foundation supported by precast, prestressed, sulfate-resistant concrete piles, between 40 and 80 ft. long. The piles would be supported on the bedrock where it is close enough beneath the ground surface to be reached easily. Where this is not the case, the piles would be supported by the friction developed between the surface of the pile and the dense sand layer below the Bay Mud. The location of each pile on the site would determine its length and whether it would be supported on bedrock or in dense sand. The sulfate-resistant mix of cement would protect the concrete and reinforcing steel from the corrosive effects of the fill and the Bay Mud. The piles would be driven at least three pile diameters apart to avoid loss of uplift capacity from group effects; piles grouped too closely do not have sufficient soil around them to provide adequate support for the foundation. The structural rigidity of the prestressed piles (produced by reinforcing steel bars and bands within the pile) would provide a large part of the lateral resistance needed to withstand the vibrations caused by earthquakes. The weight of the supported ballpark and the vertical sides of the mat foundation (the floor slab) would provide the rest of the lateral resistance through gravity. If pile locations were predrilled through the fill, noise and vibrations caused by pile driving, which could annoy neighbors or damage adjacent structures, would be reduced (see V.C. Noise, p. V.62). Predrilling would remove rubble obstructions in the fill (which otherwise could deflect the pile, thereby reducing its support capacity) and facilitate installation of the piles. The existing wooden piles would be cut off below the base of the floor slab and capped during the excavation and construction of the foundation.

LIQUEFACTION

The Treadwell & Rollo analysis indicates that seismically induced peak ground accelerations of 0.2g or higher would cause liquefaction of some of the subsurface materials at the site. The investigators estimate that during such an earthquake up to 1 ft. of liquefaction-induced settlement could occur along the Pier 46B building footprint, decreasing to about 6 inches northwest of Berry Street, and that abrupt liquefaction-induced differential settlement probably would occur in the vicinity of old timber piles under the Pier 46B and Pier 46C building, and buildings as Berry Street.

Because the ballpark would be on a new pile foundation supported below the liquefiable materials, the structure would not be affected by this liquefaction-induced settlement. However, the playing field within the ballpark would be made of new fill directly overlying liquefiable materials, and would be affected by liquefaction-induced settlement. The new fill would be leveled after the removal of the foundations of the existing buildings to be demolished. To reduce the effects of liquefaction, a strong polymer net called a geogrid would be placed on the exposed surface following foundation removal, and the playing field installed over it. The mesh construction of the geogrid would reduce such liquefaction-induced effects as lurch cracking and sand boiling, but would not prevent liquefaction-induced settlement. After a large earthquake, it would be necessary to regrade the playing field and, possibly, replace damaged portions of the proposed drainage system for the playing field.

LATERAL SPREADING

During an earthquake that produces peak ground accelerations of 0.2g or higher, the bulkhead and seawall would be subjected to high lateral forces induced by the liquefaction of some of the subsurface materials at the site. The existing system of supporting structures for the bulkhead (caisson, arched walls, grade beams), constructed 70 years ago, is deemed

inadequate under presently known seismic conditions. Detailed analysis of the supporting structures and the deteriorating piles and pile caps would be necessary during the demolition and excavation period to determine whether the proposed soil improvement program is an effective remedial measure to prevent lateral movement. The proposed soil improvement program would involve the creation of "stone columns" in the existing fill. These structures would be created by vibrating a hollow probe into the fill and injecting gravel through the probe until the fill around the column was compacted laterally. A network of these columns would be created to increase the stability of the fill and its resistance to lateral forces.

The Treadwell & Rollo analysis indicates that although the seawall is quite stable, as much as 1 ft. of lateral shift could occur during such an earthquake. The seawall was reported to have moved 3 inches during the Loma Prieta earthquake without apparent interior damage.

EMERGENCY PREPAREDNESS AND RESPONSE TO SEISMIC EVENTS

Actual performance of the ballpark structure during an earthquake and its post-earthquake condition would depend on such factors as earthquake magnitude and duration, location of source, intensity of groundshaking at the site, and integrity of the structural design. Additionally, the time of day, the day of the week, and the month of the year on which the earthquake occurred would determine the number of people in the ballpark during the earthquake.[3] These issues would be addressed through emergency response policies and plans developed specifically for the proposed ballpark based on the experience gained from responding to emergency situations at existing ballparks (see V.E. Seismicity, p. V.65).[4]

The project sponsor would ensure that the specific seismic safety requirements of large public gathering places (i.e., a ballpark, arena, auditorium) would be examined by the facility space planner and geologic and structural engineers, and that their recommendations would be incorporated in the design of the project. These requirements differ from those typical of office structures in that the ballpark would be very densely "populated" for numerous

relatively short periods at certain seasons, and virtually empty at others. Construction of earthquake-resistant infrastructure (gas, water and steam pipes), attachment of non-structural building elements (glass, fixtures and furnishings), anchoring of storage units and heavy grounds-keeping and maintenance equipment, and installation of emergency door mechanisms and lighting systems are examples of the type of facilities to be included in the examination.

NOTES - Seismicity

1. Treadwell & Rollo, *Draft Geotechnical Investigation, Pacific Bell Park, San Francisco, CA*, September 4, 1996, Appendix E, Seismic Hazard Analysis, Figures E-7 - E-12. A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

2. C. S. Shields, Geotechnical Engineer, Treadwell & Rollo, Inc., personal conversations, July 30 to October 4, 1996.

3. Steinbrugge, K. V., J. H. Bennett, H. J. Lagorio, J. F. Davis, G.A. Borchardt, and T. R. Toppozada, *Earthquake Planning Scenario for a Magnitude 7.5 Earthquake on the Hayward Fault in the San Francisco Bay Area*, California Division of Mines and Geology, Special Publication 78, 1987, pp. 87 - 93.

4. Jorge Costa, Vice President of Stadium Operations and Security, San Francisco Giants, telephone conversation, December 17, 1996.

I. CONTAMINATION AND ENVIRONMENTAL RISK

Site investigations indicate that portions of surface and subsurface soil and groundwater at the ballpark site are contaminated (see III.I. Contamination and Environmental Risk, pp. III.156 - III.157 and III.J. Water Quality and Aquatic Ecology, pp. III.176 - III.178). This section specifically addresses public health and environmental issues related to soil and groundwater contamination at the project site. Environmental hazards associated with hazardous materials present in the older structures on the project site are also discussed.

Exposure pathways are the means through which a person may come into contact with a contaminant in the environment. Exposure of persons to contaminants can occur through the following pathways:

- Soil ingestion;
- Skin contact with soil;
- Inhalation of vapors from soil;
- Inhalation of resuspended soil particles (dust);
- Ingestion of groundwater that has migrated to nearby surface water[1];
- Skin contact with groundwater that has migrated to nearby surface water;
- Inhalation of vapors from groundwater that has migrated to nearby surface water;
- Skin contact with on-site groundwater; and
- Inhalation of vapors from on-site groundwater.

During construction, workers may come into contact with contaminants present in soil via incidental ingestion or contact with skin. If excavation is performed below a contaminated groundwater table, construction workers could be exposed to the contaminants via incidental skin contact or inhalation of vapors from groundwater. Construction workers may also be exposed to contaminants present in ambient air as vapors or adhered to resuspended soil particulates.

After construction, the site would be covered by the ballpark, parking structures, and the playing field; therefore, most ballpark occupants are not expected to come into direct contact with soil or groundwater. However, ballpark workers who may be required to access subsurface soil during maintenance work in the future may be exposed to subsurface contaminants. Ballpark occupants, including ballpark workers and visitors, may also be exposed to contaminants in the air volatilized from soil or groundwater. Residents living near the project site and nearby workers may be exposed to contaminants present in ambient air as vapors or adhered to resuspended soil particulates during construction at the site.

Construction workers could also be exposed to hazardous building materials. Demolition of buildings or structures contaminated with asbestos, lead-based paint, or polychlorinated biphenyls (PCBs), which are the most common hazardous materials found in the older buildings, could cause adverse health impacts if human exposure occurs. Adherence to occupational safety standards established by federal and California Division of Occupational Safety and Health Administration (Cal-OSHA) regulations, however, minimizes health risks to construction workers.

Data required to evaluate potential risks to human health or the environment during or following construction of the proposed ballpark were collected during the site investigation.[2] Methods and procedures for the health risk evaluation described in the *Health Risk Evaluation Work Plan*,[3] followed guidelines obtained from the California Environmental Protection Agency (Cal-EPA) and U.S. Environmental Protection Agency (U.S. EPA). The health risk evaluation was conducted in accordance with the Work Plan and comments received from the San Francisco Bay Regional Water Quality Control Board (RWQCB), City and County of San Francisco Department of Public Health (SFDPH), and California Department of Toxic Substances Control (DTSC). The evaluation was divided into three components: a human health risk evaluation, a construction worker health hazard evaluation, and an ecological risk evaluation. Results of these evaluations are discussed in this section.

The site investigation conducted by Geomatrix included soil sampling to meet the requirements of Article 20, Section 1000 et seq. of the San Francisco Public Works Code, entitled "Analyzing the Soil for Hazardous Wastes", commonly known as the Maher Ordinance. Compliance with the Maher Ordinance is also discussed in this section.

RISKS TO HUMAN HEALTH

Although chemicals have been detected in soil and groundwater (see III.I. Contamination and Environmental Risk, pp. III.156 - III.157, and III.J. Water Quality and Aquatic Ecology, pp. III.176 - III.178) at the project site, not all of the chemicals are present at concentrations that may be of toxicological concern.[4] Geomatrix evaluated the potential human health risks associated with the presence of chemical concentrations that may be of toxicological concern in soil, groundwater, and ambient air through all of the potential exposure pathways applicable to the project site.

Soil Contact

Potential health risks due to exposure from chemicals in the soil by incidental ingestion or skin contact were estimated for on-site construction workers and maintenance workers assuming conservative and more realistic estimates of human exposure. The human exposure under a conservative scenario incorporates a reasonable maximum exposure (RME) defined by the U.S. EPA as the highest exposure that is reasonably expected to occur at the site. The human exposure under a more realistic scenario incorporates a most-likely exposure (MLE) which provides a more realistic estimate of potential exposure. Both carcinogenic and noncarcinogenic health risks were evaluated for all chemicals of potential concern except lead. Potential health risks to future on-site construction and maintenance workers due to the presence of lead in soil were evaluated following separate guidance developed by Cal-EPA.

The project site would be covered by the ballpark after construction. Ballpark workers or visitors during operation would not, therefore, come into direct contact with surface or subsurface soils. Since access to the site would be restricted during construction, off-site receptors, primarily residents living near the site or nearby workers, would not be expected to come into contact with chemicals in surface or subsurface soil. Recreational users of San Francisco Bay would not come into direct contact with surface or subsurface soils at the site because direct site access is not available. Also, by implementing project soil management procedures discussed in the *Soil Management Plan*[5], migration of contaminated soil due to site erosion and run-off would be minimized. Therefore, health risks to ballpark workers and visitors, off-site receptors, and recreational users of San Francisco Bay due to exposure to chemicals in the soil were not evaluated.

Water Contact

Construction workers could be exposed to chemicals in groundwater via incidental skin contact in areas where excavation is performed below the groundwater table and dewatering is required. Recreational users of San Francisco Bay could be exposed to chemicals via incidental ingestion, skin contact or inhalation of vapors if groundwater containing chemicals migrates off the project site into the Bay. Both carcinogenic and noncarcinogenic health risks were evaluated for construction workers and recreational users of the Bay assuming conservative and more realistic estimates of human exposure. Other potential receptors, including ballpark workers and visitors, and off-site receptors, would not come into contact with chemicals in the groundwater; therefore, health risks due to exposure from chemicals in the groundwater for those receptors were not evaluated.

Chemicals in Ambient Air

Potential human health risks could occur due to exposure by inhaling chemicals in the ambient air in the form of either resuspended soil particles or vapors from chemicals in the soil and groundwater. Evaluation of the health risk posed by inhalation of vapors emanating from contaminated soil or groundwater considered the site as two separate areas as shown in Figure X.F.4, Appendix F, Contamination and Environmental Risk, p. A.163: Area A pertains to groundwater represented by well point WP-06 (a small area on the south side of King Street about one-third of the distance between Second Street and Third Street) and Area B pertains to groundwater represented by all well points and Hydropunch™[6] samples except for well point WP-06 (for well point and Hydropunch™ sample locations, see Figure X.F.3, Appendix F, Contamination and Environmental Risk, p. A.162). Potential health risks from inhalation of chemicals in the ambient air by construction and maintenance workers, on-site workers and visitors during project operation, recreational users of San Francisco Bay and off-site receptors were evaluated separately for Area A and Area B. Both noncarcinogenic and carcinogenic health risks were evaluated assuming conservative and more realistic estimates of human exposure.

Results of Human Health Risk Evaluation

The health risk evaluation is performed in accordance with guidance documents provided by the Cal-EPA, U.S. EPA and other state and federal regulatory agencies as appropriate. The risk assessment process included data evaluation, exposure assessment, toxicity assessment and risk characterization for both noncarcinogenic and carcinogenic health risks. Details on the human health risk evaluation methodology are presented in Appendix F, Contamination and Environmental Risk, pp. A.155 - A.158.

The results of the human health risk evaluation are summarized in Tables IV.I.1 and IV.I.2 (pp. VI.292 and IV.293, respectively). Metals, primarily antimony, arsenic, copper, lead and mercury, and PNAs were detected in soil at various depths, locations and concentrations

across the project site (see III.I. Contamination and Environmental Risk, pp. III.160 - III.161). Concentrations of these chemicals in groundwater were low (see III.J. Water Quality and Aquatic Ecology, pp. III.177 - III.178). As shown in the tables, the estimated hazard indices for noncarcinogens (Table IV.I.1) and theoretical cancer risks for carcinogens (Table IV.I.2) are, in general, equal to or below the levels considered acceptable by regulatory agencies.

The total hazard indices for all potential receptors under conservative and more realistic scenarios are less than or equal to one as acceptable by U.S. EPA, except for a construction worker under the conservative scenario, indicating a potential for noncarcinogenic health risks to construction workers (see Table IV.I.1). The majority of this risk is attributable to incidental ingestion of and skin contact with antimony in soil.[7] Antimony and its compounds are known to cause dermatitis, keratitis, conjunctivitis and nasal septal ulceration by contact, fumes or dust.[8] However, a hazard index greater than one does not mean that such adverse health effects would be observed, as discussed further below.

The normal range of additional safety factors incorporated into reference doses (RfDs; see discussion in Appendix F, Contamination and Environmental Risk, pp. A.155 - A.156) to ensure public health protection is from 100 to 10,000; a value of 1,000 is common. This means that an exposure equal to the hazard index usually is equivalent to at least 1,000 times less than an exposure shown to have caused adverse health effects. The risk evaluation approach under the conservative scenario assumes that a construction worker has no protective equipment (i.e., shoes or appropriate clothing), which is unlikely under the requirements set by federal and Cal-OSHA. The parameters considered (i.e., exposure time, chemical dose, body weight) are under worst case conditions, and therefore are very conservative.[9] Therefore, the hazard index needs to be interpreted carefully. There is no clearly defined line distinguishing between acceptable and unacceptable exposure, but rather the hazard index indicates whether the underlying data should be further reviewed before determining whether an exposure is unacceptable. In this case the majority of the increase in hazard index is due to theoretical exposure to antimony. The RfD was established as one-

TABLE IV.I.1
SUMMARY OF NONCARCINOGENIC HUMAN HEALTH RISK EVALUATION RESULTS
Hazard Indices
Acceptable Levels Less than or Equal to One[1]

Scenario	Soil Contact[2]	Water Contact[3]	Air[4]		Hazard Indices	
			Area A[5]	Area B[6]	Area A	Area B
Construction Worker						
RME	2	0.3	1	0.06	3	2
MLE	0.2	0.02	0.5	0.008	0.7	0.2
Maintenance Worker						
RME	0.3	NA	NA	0.01	NA	0.3
MLE	0.03	NA	NA	0.002	NA	0.04
On-site Worker						
RME	NA	NA	0.1	0.000004	0.1	0.000004
MLE	NA	NA	0.05	0.000002	0.05	0.000002
Site Visitor						
RME	NA	NA	0.06	0.0001	0.06	0.0001
MLE	NA	NA	NA	0.0000007	NA	0.0000007
Recreational User of San Francisco Bay[7]						
RME	NA	0.01	NA	0.00009	NA	0.01
MLE	NA	0.00006	NA	0.000001	NA	0.00006

Notes:
RME = Reasonable maximum exposure (conservative).
MLE = Most likely exposure (more realistic).
NA = Not applicable

1. U.S. Environmental Protection Agency, *Risk Assessment Guidance for Superfund*, Volume I, Human Health Evaluation Manual, Part A, Interim Final: Office of Emergency and Remedial Response, Washington, D.C., 1989. The methodology for calculating hazard indices is presented in Appendix F., Contamination and Environmental Risk, pp. A.155 - A.157.
2. Soil contact includes incidental ingestion and skin contact.
3. Water contact includes incidental ingestion and/or skin contact.
4. Air includes inhalation of resuspended soil particulates and/or inhalation of vapors from soil or groundwater.
5. Area A pertains to groundwater represented by well point WP-06 (see Figure X.F.3, Appendix F, Contamination and Environmental Risk, p. A.162).
6. Area B pertains to groundwater represented by all well points and hydropunch samples except for well point WP-06 (see Figure X.F.3, Appendix F, Contamination and Environmental Risk, p. A.162).
7. Area A and Area B do not pertain to the recreational users of San Francisco Bay; exposure to surface water via incidental ingestion, skin contact, and inhalation of vapors was based on a single estimate of surface water concentrations.

Source: Geomatrix Consultants, Inc.

TABLE IV.I.2
SUMMARY OF CARCINOGENIC HUMAN HEALTH RISK EVALUATION RESULTS
Cancer Risks[1]
Acceptable Levels Between 1 in 1 Million and 100 in 1 Million[2]

Scenario	Soil Contact[3]	Water Contact[4]	Air[5]		Excess Cancer Risk	
			Area A[6]	Area B[7]	Area A	Area B
Construction Worker						
RME	3	0.6	5	0.03	9	3
MLE	0.3	0.03	3	0.004	3	0.3
Maintenance Worker						
RME	10	NA	NA	0.1	NA	10
MLE	0.3	NA	NA	0.004	NA	0.3
On-site Worker						
RME	NA	NA	6	0.0002	6	0.0002
MLE	NA	NA	0.6	0.00002	0.6	0.00002
Site Visitor						
RME	NA	NA	2	0.003	2	0.003
MLE	NA	NA	NA	0.00002	NA	0.00002
Recreational User of San Francisco Bay[8]						
RME	NA	0.1	NA	0.002	NA	0.1
MLE	NA	0.001	NA	0.00002	NA	0.001

Notes:
RME = Reasonable maximum exposure (conservative).
MLE = Most likely exposure (more realistic).
NA = Not applicable

1. Cancer risks presented as "x" in 1 million, e.g., 0.6 is 6 in 10 million which is less than 1 in 1 million, 9 is 9 in 1 million which is less than 100 in 1 million.
2. *National Oil and Hazardous Substances Pollution Contingency Plan, 55 Federal Register 8666*, March 1990.
3. Soil contact includes incidental ingestion and skin contact.
4. Water contact includes incidental ingestion and/or skin contact.
5. Air includes inhalation of resuspended soil particulates and/or inhalation of vapors from soil or groundwater.
6. Area A pertains to groundwater represented by well point WP-06 (see Figure X.F.3, Appendix F, Contamination and Environmental Risk, p. A.162).
7. Area B pertains to groundwater represented by all well points and hydropunch samples except for well point WP-06 (see Figure X.F.3, Appendix F, Contamination and Environmental Risk, p. A.162).
8. Area A and Area B do not pertain to the recreational users of San Francisco Bay; exposure to surface water via incidental ingestion, skin contact, and inhalation of vapors was based on a single estimate of surface water concentrations.

Source: Geomatrix Consultants, Inc.

thousandth of the no effect level in an experiment conducted in rats. In aggregate, the available data on antimony suggests that the RfD is set at a level of exposure with a substantial margin of safety. The hypothetical exposure leading to a hazard index greater than one in this case does not suggest an unacceptable risk to the potential future construction worker. The substantial margin of safety incorporated in this approach suggests that adverse health effects, if any, would be associated with a hazard index much larger than 1; probably in the range of 50 to 100.[10]

Also, because the hazard index based on more realistic estimates of human exposure is below one, the RWQCB believes that exposure to chemicals in the soil is not expected to pose a noncarcinogenic health risk to construction workers.[11] The oversight agencies approved the *Site Investigation Report and Risk Evaluation* which presents the results of the human health risk evaluation for the ballpark site and do not require further soil and groundwater remediation.[12]

The estimated lifetime cancer risks presented in Table IV.I.2, p. IV.293, fall either below the level of insignificant risk, i.e., less than 1 in 1 million (e.g., 0.03 in Table IV.I.2 indicates cancer risk of 3 in 100 million which is less than 1 in 1 million) or between acceptable levels of 1 in 1 million and 100 in 1 million (e.g., 3 in Table IV.I.2 indicates cancer risk of 3 in 1 million which is less than 100 in 1 million). The range of acceptable risk is applicable to the ballpark project because, as discussed in the methodology, the approach used to estimate cancer risks consistently overpredicts the actual risk.

The presence of chemicals in soil, groundwater and ambient air (as dust or vapors) at the ballpark site is not expected to pose an unacceptable noncarcinogenic or carcinogenic risk to workers (construction workers or ballpark employees) or visitors at the site, nearby residents or workers, or recreational users of San Francisco Bay.

The Centers for Disease Control (CDC) have established a blood-lead level of concern at 10 micrograms per deciliter (μg/dl) of whole blood to protect young children from adverse neurological effects. The Cal-EPA has adopted the 10 μg/dl significance level established by

the CDC for both children and adults. The *California Code of Regulations,* Title 8, Section 1532.1, Lead in Construction standard recommends 30 μg/dl as the blood-lead level of concern. The estimated blood-lead levels for construction and maintenance workers with potential for exposure to lead in soil at the project site are equal to or below the level of concern adopted by the Cal-EPA and well below the level of concern established in the *California Code of Regulations* Lead in Construction standard indicating that exposure to lead in soil would not pose an unacceptable risk to construction and maintenance workers.[13]

POTENTIAL HEALTH HAZARD DUE TO UNKNOWN SITE CONDITIONS

The health risk evaluation was designed to assess potential health risks associated with exposure to chemicals present in soil or groundwater at the project site. Based on the results of the health risk evaluation, the presence of chemicals in soil at the project site is not expected to pose an unacceptable noncarcinogenic or carcinogenic risk to identified receptors.

Construction workers could potentially encounter other chemical hazards, for example, unanticipated hazardous chemicals or buried structures during site development that were not identified during the site characterization. Such hazards would be addressed in a Site Health and Safety Plan as required by federal and Cal-OSHA. The project sponsor would be required to ensure that the construction contractor prepares, submits and implements a Health and Safety Plan prepared by a certified industrial hygienist, to meet all applicable federal, state, and local environmental and worker safety laws. The Plan would establish policies and procedures to protect workers and the public from potential hazards posed by unanticipated hazardous materials at the project site, and would be prepared according to federal and Cal-OSHA regulations for hazardous materials/waste health and safety plans. The Site Health and Safety Plan would include items applicable to site conditions, such as identification of contaminants and potential hazards, material-handling procedures, dust suppression measures, personal protection clothing and devices, controlled access to the site, health and safety training requirements, use of monitoring equipment during construction to verify health and

safety of workers and the public, measures to protect public health and safety, and emergency response procedures.

Since coal tar was observed in several historical borings and three recent borings at depths below 10 feet (ft.) below ground surface (bgs), it is possible that coal tar may be encountered during some of the deeper excavation work at the site. The Site Health and Safety Plan would, therefore, also include contingencies for the possibility of encountering coal tar.

There is also a potential for encountering USTs during excavation activities at various locations at the project site (see Figure X.F.2, Appendix F, Contamination and Environmental Risk, p. A.160). In addition, there may be buried drums or other subsurface hazards.[14] Because the contents of USTs may be hazardous, materials stored in a UST that is unexpectedly uncovered, disturbed, or damaged during excavation could threaten the health and safety of construction workers. A relatively high percentage of older USTs have leaked at some point in their lifetime. A leaking UST could pose threats to the environment and could also pose a possible explosion hazard. The Site Health and Safety Plan would include a contingency plan to prevent exposure to soils contaminated by a leaking UST or hazards from buried structures. The project sponsor would ensure that probing (geophysical exploration) is done after demolition and prior to excavation in the area of suspected tanks (tank locations 3 through 7 in Figure X.F.2, Appendix F, Contamination and Environmental Risk, p. A.160). USTs, if encountered during site excavation, would be closed according to regulatory guidelines provided by the RWQCB and the SFDPH as required by Title 23 of the *California Code of Regulations* and Article 21 of the San Francisco Health Code (the San Francisco tank removal ordinance).

Removal activities could pose both health and safety risks, such as the exposure of workers, tank-handling personnel, and the public to tank contents or vapors. Risks posed by USTs would be minimized by closing the tank according to the applicable regulatory requirements. Such requirements include removing and properly disposing of any remaining hazardous materials in the tank, having the tank removal supervised by regulatory agencies, testing the

soil under the tank for contamination, as appropriate; recycling or disposing of the discarded tank; evaluating potential health or ecological risks associated with contaminated soil, if any; removing and disposing of any contaminated soil, if necessary; and filing a tank closure report with the RWQCB and the SFDPH.

In the event soils or groundwater affected by chemicals from tank leaks were removed from the project site, a Hazardous Materials Management Plan would be prepared and implemented. The Hazardous Materials Management Plan would include a description of any additional sampling that would be performed for further site characterization, planned hazardous materials handling methods, and removal and disposal procedures. The Hazardous Materials Management Plan would require that all hazardous materials handling, removal and disposal be undertaken in accordance with applicable federal, state and local hazardous materials laws and regulations.

COMPLIANCE WITH MAHER ORDINANCE

As discussed in III.I. Contamination and Environmental Risk, p. III.151, the Maher Ordinance requires site permit applicants who propose to disturb of 50 cubic yards of soil or more east of the 1851 high tide line to conduct environmental site assessments. Because this entire area is composed of artificial fill and the ballpark site falls within this area, a site assessment prior to construction is required to identify hazardous materials that would potentially be encountered during excavation.

Geomatrix was retained by the project sponsor to conduct a site assessment that would meet the requirements of the Maher Ordinance for the ballpark site. A Work Plan to conduct the site assessment was prepared which included the results of past site investigations and the site history.[15] The Work Plan did not include the South-of-Channel parking areas for analysis because the proposal for the parking areas was developed after the scope was determined for the site investigation. The Work Plan and its attachments[16] satisfy the requirements for the Site History as set forth in the Maher Ordinance.[17] The site investigation results as outlined in the *Site Investigation Report and Risk Evaluation*, dated October 1996, and its attachment[18] satisfy

the requirements for the Soil Analysis Report as set forth in the Maher Ordinance.[19] A discussion on site background and project site investigation summarizing soil sampling results is presented in III.I. Contamination and Environmental Risk, pp. III.154 - III.157.

The soil samples analyzed as part of the project site investigation indicate that the ballpark site contains chemicals in soil in localized areas that exceed the state or federal hazardous waste standards.[20] The Maher Ordinance requires the project sponsor to submit a Site Mitigation Plan to the appropriate regulatory agencies and to implement an approved Site Mitigation Plan prior to issuance of any building permit where hazardous wastes are found to exceed the state or federal standards. The project sponsor submitted a *Soil Management Plan,* prepared by Geomatrix and dated November 1996, to the RWQCB. The *Soil Management Plan* satisfies the requirements for the Site Mitigation Plan as set forth in the Maher Ordinance.[21]

Although chemicals in the soil at the ballpark site were found to exceed regulatory hazardous waste standards, the results of the human health risk evaluation indicate that those chemicals in the site soil do not pose an unacceptable risk as discussed on p. IV.294. The *Soil Management Plan,* which serves as a Site Mitigation Plan under the Maher Ordinance, describes the handling, storage and disposal of excavated soils. The plan also describes procedures to limit site access during construction and the need, if any, for long-term soil management at the site. The soil handling and storage procedures are discussed in IV.J. Water Quality and Aquatic Ecology, pp. IV.309 - IV.311.

Construction procedures at the ballpark project site, discussed below, have been designed to minimize the generation of excess soil, and off-site disposal of soil is not anticipated. However, any excess soil that would not be incorporated into the site grading would be disposed of at an out-of-state Class II facility or a California Class I facility.[22]

In accordance with current design plans, the entire ballpark site would be "encapsulated" (covered) either by the ballpark buildings or several feet of imported fill for the playing

field. The utilities at the site would be set in a 3 ft. concrete foundation of the ballpark buildings or within the 3 ft. imported fill layer in the playing field. Existing soils within the playing field area would be removed to depths varying from 4 to 7 ft. A continuous geotextile membrane (polymer net) would be placed over the entire excavated area and the excavated soils would be returned and recompacted in place on top of the geotextile membrane.[23] An imported fill layer including the drainage system for the playing field would be placed on top of the native soils.

Site access during construction would be limited via a fence surrounding the site and a primary gate open only during construction hours. A secondary access would be used only for emergency purposes.

The native soil, or the fill soil currently at the site, would not be encountered during the operation phase of the project. In addition, a breach in the cover over the native soil is not anticipated because the foundation would be 3 ft. thick and at least 3 ft. of imported fill would cover the playing field. Although not anticipated, if future site maintenance work requires soil excavation generating waste soil, the soil would be handled, stored and disposed as discussed above.

The Maher Ordinance also requires that upon completion of the site mitigation a certification report be prepared certifying that:

- No hazardous wastes in the soil are causing, or are likely to cause, significant environmental or health and safety risks, and therefore no mitigation is recommended;
- All mitigation measures recommended in the site mitigation report have been performed, and that mitigation has been verified by follow-up soils analysis if recommended in the site mitigation report; or
- If applicable, the applicant has received certification or verification from the appropriate federal or state agencies that mitigation is complete (Maher Ordinance, Section 1005).

The project sponsor would prepare a certification report as required by the SFDPH. The certification report would also include additional information, including responsible persons, facility map, cap maintenance procedures, a health and safety plan, and a contingency plan, to complete the long-term *Soil Management Plan* as required by the SFDPH.[24]

Construction activities for the proposed parking area south of the Channel would consist of removing existing pavement, site grading, and shallow trenching to install utilities. Groundwater is unlikely to be encountered during these activities. Buildings currently present in this area would remain and sites which may be badly contaminated (e.g., possibly portions of H&H Ship Services) would be avoided.

If more than 50 cubic yards of soil would be disturbed for the construction, requirements for the Maher Ordinance would need to be addressed prior to construction. These requirements include preparing a Site History of the parcel and, if the Site History indicates the potential for chemicals to have been released at the site, soil sampling for chemical analysis would be performed in areas of the parcel that would be disturbed. Because groundwater would not be encountered during the construction of the proposed parking area, groundwater sampling would not be needed. If soil sampling indicates the presence of elevated concentrations of chemicals in the soil, a risk evaluation can be performed to assess needed mitigation measures, if any. SFDPH provides oversight throughout this process; construction can proceed only if Maher Ordinance requirements have been addressed to the satisfaction of the SFDPH.

Regardless of the amount of soil to be excavated, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared for the South of Channel sites, and would address potential erosion, sedimentation, and contamination in runoff to the satisfaction of the RWQCB.

HAZARDOUS BUILDING MATERIALS

Past investigations indicate the presence of hazardous building materials in the existing buildings at the project site (see III.I. Contamination and Environmental Risk, pp. III.157 - III.158).

Asbestos

Asbestos, a naturally occurring fibrous material, was used in the past in many building materials for its fireproofing and insulating properties. Asbestos fibers could cause adverse health effects for construction workers. Medical evidence published in 1986 by the U.S. EPA suggests that exposure to asbestos fibers is harmful to human health. Inhalation of airborne fibers is the primary mode of asbestos entry into the body, making the friable[25] materials the greatest health threat. Asbestos can cause lung cancer and asbestosis.[26] The U.S. EPA believes that exposure to all airborne asbestos fibers should be reduced to the greatest extent possible. The California Department of Health Services (DHS) has classified friable, finely divided, and powdered wastes containing greater than one percent of asbestos as hazardous waste.[27] If material is not friable, it is considered to be a nonhazardous waste, regardless of its asbestos content, and thus can be handled as ordinary construction waste. Prior to issuance of a building permit for partial or complete demolition of existing buildings, the Department of Building Inspection requires evidence that all asbestos has been removed in accordance with federal and state regulations. Removal of asbestos must comply with applicable federal and state regulations.

In accordance with State law, the project sponsor would employ a licensed asbestos abatement contractor certified by the Contractors Licensing Board of the State of California to remove all asbestos-containing building materials prior to demolition of the buildings at the project site. Abatement and Demolition Project Specifications would be prepared by a California Certified Asbestos Consultant for use by the abatement contractors. A Health and Safety Plan would be required from the contractors and would be in place prior to commencing work on any contaminated structure or building.

Asbestos abatement contractors would follow state regulations contained in *California Code of Regulations*, Title 8, Section 1529 and Sections 341.6 through 341.14 where there is asbestos-related work involving 100 square feet or more of asbestos-containing material. The contractor and hauler of the asbestos materials would file a Hazardous Waste Manifest which details the hauling of the materials from the site to the disposal facility and would manage such materials in accordance with Cal-OSHA, U.S. EPA, DTSC, and Bay Area Air Quality Management District (BAAQMD) regulations, and federal, state and local laws, including Titles 22 and 23 of the *California Code of Regulations* and the City's Hazardous Materials Ordinance. The owner of the buildings to be demolished would be required to have a Hazardous Waste Generator Number assigned by and registered with the DHS.

Section 19827.5 of the California Health and Safety Code requires that no demolition permit may be issued by a local agency until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding asbestos. The BAAQMD must be notified ten days in advance of any proposed abatement or demolition work. The local office of Cal-OSHA must be notified of asbestos abatement to be carried out. Notification includes the names and addresses of operations and persons responsible; description and location of the structure to be demolished/altered including size, age and prior use, and the approximate amount of friable asbestos; scheduled starting and completion dates of demolition or abatement; nature of planned work and methods to be employed; procedures to be employed to meet BAAQMD requirements; and the name and location of the waste disposal site to be used. The BAAQMD randomly inspects asbestos removal

operations. In addition, the BAAQMD inspects any removal operation concerning which a complaint has been received.

Pursuant to California law, the San Francisco Department of Building Inspection would not issue the required permit until the notice requirements described above are complied with. These regulations and procedures, established as part of the permit review process, would ensure that any potential impacts due to asbestos would be reduced to a level of insignificance.

Lead

Lead may cause both acute and chronic toxicity in human bodies.[28] Lead poisoning in adults is usually occupational due mainly to inhalation of lead dust or fumes.[29] Federal and Cal-OSHA have established the Lead Construction Standard which defines safe exposure levels for lead in construction work.

The Lead Construction Standard establishes a Permissible Exposure Limit (PEL) of 50 micrograms per cubic meter of air for an employee over an eight-hour time-weighted average. The standard does not list a minimum concentration of lead in a material to be considered as lead-containing material. All work with material containing a concentration of lead above the analytical laboratory's reporting limit[30] therefore must be treated as having a potential to exceed the PEL unless it can be proved that the air concentrations of lead being produced are below the PEL.

An Abatement Plan would be prepared by a qualified environmental specialist. Project activities expected to disturb lead-based paint materials would be performed by licensed and certified contractors. The contractor would be required to manage the lead-based paint on building materials in accordance with Cal-OSHA, DTSC and BAAQMD regulations and the

applicable federal, state, and local laws, including Titles 22 and 23 of the California Code of Regulations and the City's Hazardous Materials Ordinance.

Polychlorinated Biphenyls

PCBs are highly stable hazardous chemicals that are known to cause long-term deleterious environmental and health effects. Toxic effects in humans include pigmentation of skin and nails, excessive eye discharge, swelling of eyelids, gastrointestinal disturbances and cancer. Examples of toxic symptoms in animals include weight and hair loss and reduced ability to reproduce.

PCBs, formerly used primarily as electrical insulators in electrical equipment, were banned in 1976 for future use. In commercial buildings, PCBs might be found in transformers and light ballasts, and would be removed prior to demolition.

At the project site, light fixtures and transformers with PCBs would be removed prior to demolition and disposed of according to the federal regulations for handling materials with PCBs contained in Title 40 of the *Code of Federal Regulations*.

NOTES - Contamination and Environmental Risk

1. Groundwater flow directions and potential migration of contaminants to surface water are discussed in III.J. Water Quality/Aquatic Ecology, pp. III.175 - III.176.

2. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California*, Volume 1, October 1996.*

3. Geomatrix Consultants, Inc., *Health Risk Evaluation Work Plan, Giants Pacific Bell Park Site, San Francisco, California*, August 1996.*

4. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California*, Volume 1, October 1996.*

5. Geomatrix Consultants, Inc., *Soil Management Plan, Giants Pacific Bell Park Site, San Francisco, California*, San Francisco, California, November 1996.*

6. The hydropunch method uses a specially designed tool that collects grab groundwater samples from soil boring holes.

7. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California*, Volume 1, October 1996.*

8. Merck & Company, *Merck Index*, 11th edition, Rahway, New Jersey, 1989.

9. Ravi Arulanantham, Toxicologist, San Francisco Bay Regional Water Quality Control Board, personal conversations, January 30, 1997.

10. Gregory P. Brorby, DABT, Senior Toxicologist, Geomatrix Consultants, Inc., personal conversations, October 10, 1996.

11. Ravi Arulanantham, Toxicologist, San Francisco Bay Regional Water Quality Control Board, personal conversations, January 30, 1997.

12. Letter from Stephen I. Morse, Chief of Toxics Cleanup Division, San Francisco Bay Regional Water Quality Control Board, to John Yee, San Francisco Giants, dated November 25, 1996.

13. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California*, Volume 1, October 1996.*

14. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California*, Volume 1, October 1996.*

15. Geomatrix Consultants, Inc., *Work Plan for Investigation of the Giants Pacific Bell Park Site*, San Francisco, California, May 1996.*

16. a) Geomatrix Consultants, Inc., Addenda to *Work Plan for Investigation of the Giants Pacific Bell Park Site*, San Francisco, California, May 1996 (Addendum 1, May 1996 and Addendum 2, July 1996).*

    b) Memoranda prepared by Geomatrix Consultants: "Response to Comments on Addendum 2 and Approach for Assessing Extent of Chemical Containing Water near a Subsurface Utility Beneath Berry Street," August 22, 1996 and Additions to Addendum 2 of the Work Plan, September 20, 1996.*

17. Letter from Ben Gale, Director, City and County of San Francisco, Department of Public Health, to John Yee, San Francisco Giants, dated December 3, 1996.

18. Letter from Amanda L. Spencer, Senior Geologist, Geomatrix Consultants, to Vic Pal, San Francisco Bay Regional Water Quality Control Board, dated November 22, 1996.

19. Letter from Ben Gale, Director, City and County of San Francisco, Department of Public Health, to John Yee, San Francisco Giants, dated December 3, 1996.

20. Letter from Stephen I. Morse, Chief of Toxics Cleanup Division, San Francisco Bay Regional Water Quality Control Board, to John Yee, San Francisco Giants, dated October 16, 1996.

21. Letter from Ben Gale, Director, City and County of San Francisco, Department of Public Health, to John Yee, San Francisco Giants, dated December 3, 1996.

22. Geomatrix Consultants, Inc., *Soil Management Plan, Giants Pacific Bell Park Site, San Francisco, California*, November 1996.*

23. Letter from Ben Gale, Director, City and County of San Francisco, Department of Public Health, to John Yee, San Francisco Giants, dated December 3, 1996.

24. Letter from Ben Gale, Director, City and County of San Francisco, Department of Public Health, to John Yee, San Francisco Giants, dated December 3, 1996.

25. Friable materials are those that can be crumbled easily.

26. A disease of the lungs caused by the inhalation of asbestos fibers, an irritant mineral.

27. California Code of Regulations, Title 22, Division 4.5, Section 66261.24 and California Department of Health Services Toxic Substances Control Program, Waste Evaluation Unit, Asbestos Handling, Transport and Disposal Fact Sheet, 1990.

28. Merck & Company, *Merck Index*, 11th edition, Rahway, New Jersey, 1989.

29. Merck & Company, *Merck Index*, 11th edition, Rahway, New Jersey, 1989.

30. Minimum chemical concentration that can be detected and reported by the analytical laboratory.

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

J. WATER QUALITY AND AQUATIC ECOLOGY

IMPACTS OF BALLPARK CONSTRUCTION ACTIVITIES

Sedimentation From Storm Water Runoff

Water quality and aquatic ecology of China Basin Channel may be adversely affected by changes in physical and chemical composition. One potential source contributing to adverse physical water quality changes is uncontrolled storm water runoff carrying sediment and potential contaminants from the ballpark construction site to the Channel and causing turbidity in the water and potential accumulation of contaminants in aquatic organisms.

The ballpark site is relatively flat, and substantial erosion during wet weather is not anticipated during construction. However, the approximate 12-month period of demolition and excavation would expose large areas of soil. Water would fall on the site during rainfall events, and water would be used on the construction site for construction purposes such as equipment washing and dust control. Water contact with the soil surface would dislodge and suspend soil particles that could be transported to China Basin Channel. The rate of water moving over exposed soil surfaces would be relatively slow because of the flatness of the site, but particles of soil would be loosened, picked up by the water, and potentially transported off the construction site.

Particulate-laden waters entering China Basin Channel from the construction site could degrade the water quality and aquatic ecology of the Channel by increasing turbidity in the water. Turbidity is a condition in which the concentration of particles suspended in the water is increased, making water appear cloudy. Turbidity may reduce dissolved oxygen levels in water and may decrease light penetration into the water which would reduce the amount of algal photosynthesis in the surface waters of the Channel, and may impact the quality of the local habitat for certain beneficial uses, such as the suitability of the habitat for

benthic (bottom-dwelling) organisms, for sessile (attached; not free to move about; e.g., sponges and anenomes) organisms attached to the surfaces of bulkheads and pilings in the area, and for Pacific herring spawning.

Photosynthesis is a plant process during which light energy is converted to chemical energy. Algae (one-cell plant organisms) produce their own food by performing photosynthesis in water environments such as China Basin Channel. Algal photosynthesis generally takes place at or near the water surface where light penetration is greatest. Turbid waters reduce the amount of light penetrating the water, thus reducing the survival of algae. Because algae is an important food source for fish and other organisms that inhabit upper aquatic zones, turbidity may reduce the amount of algae available for those organisms.

Increased turbidity in the Channel could affect organisms which obtain their food by filtering suspended particulate matter from the water column. Such organisms are referred to as "suspension-feeders," and include barnacles, clams, mussels, and aquatic worms. Increased concentrations of suspended material in the water could be beneficial if it included organically rich particulate matter of a size suitable for use by benthic and attached organisms. However, suspended material also could include concentrated toxic and potentially toxic materials that could result in increased accumulation of chemical toxicants in the biota. Please see the discussion of Resuspension of Contaminated Sediments on p. IV.313.

Deposition of suspended particulates at the mouth of China Basin Channel could change certain characteristics of the habitat that make the site a potential spawning ground for Pacific herring (*Clupea harengus pallasi*) and reduce the potential for spawning at the mouth of the Channel. Pacific herring eggs are lain on rocky substrates. Deposition of suspended particles during the spawning season of December 1 to March 1 could fill spaces between rocks, suffocating eggs lain there. Fish growing from surviving eggs could develop growth abnormalities.[1]

Deposition of suspended particulates at the mouth of China Basin Channel also could contribute to siltation at Pier 48, located across the Channel from Pier 46B. During construction, siltation at Pier 48 could affect navigability and may necessitate maintenance dredging sooner than would normally be needed. Siltation at Pier 48 would not be a long-term effect because it would occur during construction only.

Storm water quality, including sedimentation in runoff, is regulated by the State Water Resources Control Board (State Water Board). The State Water Board adopted the General Construction Activity Storm Water Permit in 1992 for the state and has delegated implementation and enforcement authority to the nine Regional Boards in the state.[2] The San Francisco Bay Regional Water Quality Control Board (RWQCB) is the agency in the Bay Area that enforces the state's general permit. Storm water discharges associated with construction activities (clearing, grading, and excavation) involving ground disturbance of 5 acres or more must be covered under the permit.

As discussed in III.J. Water Quality and Aquatic Ecology, pp. III.173 - III.174, storm water on approximately the northern half of the 12.5-acre ballpark construction site drains into City sewers along King Street and Berry Street. This storm water is treated at the City's Southeast Water Pollution Control Plant prior to discharge to the San Francisco Bay. The approximate 6-acre area south of Berry Street and the edge of the triangular-shaped South-of-Channel parking area that adjoins the Channel (see Figure II.D.5, p. II.20) are not presently connected to the City's combined sewer and drain directly into the Channel without treatment. During the demolition phase, an existing 12-inch sanitary sewer in Berry Street on the ballpark site would be used to collect and route storm water runoff for treatment at the Southeast Water Pollution Control Plant. After demolition of existing structures on the site, the 12-inch sewer would be removed, and storm water may drain to the Channel without treatment during the construction period. All storm water on the future completed ballpark site would drain into City sewers. However, before the ballpark's internal infrastructure is completed, the southern half of the site would potentially contribute sediment to China Basin Channel. The edge of the triangular-shaped South-of-Channel

parking area that adjoins the Channel also would potentially contribute sediment to the channel during grading and paving. However, those activities would be completed in a relatively short time period.

Because the area potentially contributing sedimentation to China Basin Channel is more than 5 acres, the RWQCB would require the project to be covered under the state's General Construction Activity Storm Water Permit. Landowners are responsible for obtaining coverage and complying with permit requirements, but may delegate specific compliance duties to developers and contractors by mutual consent. In this case, the project sponsor would obtain coverage under the permit by filing a Notice of Intent form with the State Water Board. Coverage is granted once the completed form is received.

As a requirement of the permit, the project sponsor is responsible for preparing, retaining at the construction site, and implementing, a Storm Water Pollution Prevention Plan (SWPPP) which describes the site, erosion and sediment controls, means of waste disposal, implementation of approved local plans, control of post-construction sediment and erosion control measures and maintenance responsibilities, and non-storm water management controls. The project sponsor also is responsible for having construction sites inspected by qualified individuals before and after storms to identify storm water discharge from construction activity, and to identify and implement controls where necessary. The SWPPP would be prepared in accordance with guidelines contained in the general permit and in the *Construction Best Management Practice Handbook*.[3]

The SWPPP for the ballpark would be prepared separately from this Environmental Impact Report. The following are typical measures that the SWPPP may require to minimize sedimentation related to storm water and to manage other aspects of the construction site:

- Schedule as much demolition and excavation during the dry season from April 30 to November 1 of each year as is feasible. If not possible, schedule major events of building demolition and soil disruption during periods of no-to-light rainfall.

- Minimize the area and length of time during which the site is cleared and graded.
- Prevent the release of construction pollutants such as cement, mortar, paints and solvents, fuel and lubricating oils, pesticides and herbicides by storing such materials in a bermed area.
- Install filter fences around the perimeter of the construction site, especially along the north and south edges of the Channel to remove sediments.
- Install and maintain sediment and oil and grease traps in local storm water intakes during the construction period.
- Clean wheels and cover loads of trucks carrying excavated soils before they leave the construction site.
- Implement a hazardous material spill prevention, control and cleanup program for the construction period. The program would include measures such as constructing swales and barriers that would direct any potential spills away from China Basin Channel and into containment basins to prevent the movement of any materials from the construction site into the Channel. The program also would include measures to control potential spills of fuel from tugboats proposed for use in water transport of construction materials.

In addition to the SWPPP that would be prepared for the project, the City and the RWQCB would require the project to comply with measures identified in the project's *Soil Management Plan* for the handling, storage, and disposal of excavated soils.[4] The *Soil Management Plan* was prepared in conjunction with the *Site Investigation Report and Risk Evaluation* performed for the ballpark site (see IV.I. Contamination and Environmental Risk, pp. IV.297 - IV.300, and Appendix F, Contamination and Environmental Risk, pp. A.152 - A.153).[5] Although the plan emphasizes the management of soils containing hazardous chemicals, two of the measures identified in the plan address ways to reduce erosion and sedimentation potentially resulting from stockpiling of excavated soils:

- Minimize dust during demolition, grading, and construction by lightly spraying exposed soil on a near-continuous basis.
- Minimize wind and water erosion on temporary soil stockpiles by spraying with water during dry weather and covering with plastic sheeting or other similar material during the rainy season (November to March).

The implementation of erosion and sediment control measures in the SWPPP and in the *Soil Management Plan* would minimize the amount of sediment in storm water runoff from the site into China Basin Channel, avoiding impacts caused by turbidity.

Turbidity From Barge and Tugboat Activity

Barges moved by tugboats would be used for approximately 21 months during the demolition, excavation/foundation, and construction phases. Due to the shallow depth of China Basin Channel, the propellers of the tugboats would create currents (propwash) that could scour material from the bottom of the Channel and resuspend it, increasing turbidity. The implications for aquatic life would be the same as those previously described for turbidity caused by storm water runoff.

Most construction materials for the ballpark would arrive at the construction site by truck. Barges would be used to bring in certain massive materials such as the precast concrete piles to be used in the substructure of the ballpark. Barges also would be used for construction office space, short-term storage and staging of materials, and for performing repairs on the bulkhead. Barges would enter China Basin Channel and would berth along the existing walkway.

The amount of propwash that would induce resuspension of material depends on the speed of the propeller and its depth below the surface of the water. Water depths along the existing bulkhead are between 12 and 20 feet (ft.).[6] The sediments in the shallower portions of the Channel along the bulkhead would be resuspended first by propwash. Sediments on the Channel bottom would be removed by propwash until the Channel reached a depth at which the bottom sediments no longer would be subject to scouring. Thus, as the Channel was deepened, turbidity caused by tugboat propwash would decrease over time. Most resuspended sediments would be carried away by currents and would re-deposit in areas of

reduced current flow, either upstream of the site in the Channel or in nearby areas of San Francisco Bay.

Resuspension of sediment by propwash would be greatest at the beginning of tugboat activity and would decrease through the 21-month period as more sediment is removed from the Channel bottom, and the Channel becomes deeper. The degree of sediment resuspension could be reduced through the use of shallow-draft tugboats moving at slow speeds. Shallow-draft tugboats float higher in the water than deep-draft tugboats, so that the propeller would be farther away from the bottom of the Channel (see V.F. Water Quality and Aquatic Ecology, p. V.66).

Spills From Construction Site

Besides sediment, the construction site also may contribute contaminants or potentially toxic chemicals to the waters at the mouth of China Basin Channel. Sources of potentially toxic substances at construction sites include spills of fuels and lubricants for construction machinery and tugboats, solvents used for cleaning parts, chemicals used for treatment of construction materials, paints, and other materials. Contaminants and potentially toxic substances spilled from the site, tugs or barges could increase the concentrations of such substances in the waters of the Channel and the contiguous waters of San Francisco Bay, which could result in bioaccumulation or toxicity.

Contaminants such as petroleum-related compounds could be spilled from the construction site, tugs or barges. Spills of such compounds could form oil slicks that injure or kill protected or endangered animal species, including California sea lions, California brown pelicans, or species of commercial importance, such as the Pacific herring. A spill contingency plan would be prepared by the project sponsor as part of the Construction SWPPP (see the previous discussion under Sedimentation From Storm Water Runoff).

Resuspension of Contaminated Sediments

The greatest potential for resuspension of sediment would occur during filling or dredging. No dredging within the waters of the Channel or Bay is proposed for construction of the ballpark. Some minor fill would occur for bulkhead repair activities and fill associated with placement of piles for the connecting pier and for the ferry (see pp. IV.319 - IV.320, and VII.A. Ferry Service Variant, pp. VII.1 - VII.9). Also as previously discussed, barge and tugboat activity would cause resuspension of substantial quantities of sediments containing contaminants. Contaminants concentrate in sediments by adsorbing onto the surface of individual particles. Certain contaminants dissolve more easily in water than others. When sediment is resuspended in water, contaminants sometimes re-dissolve. Sediment resuspension in China Basin Channel could increase the concentrations of contaminants and potentially toxic substances in the water at the mouth of the Channel and potentially in the open waters of San Francisco Bay. This could result in increased accumulation of contaminants and potentially toxic substances in the biota of San Francisco Bay, exacerbating an already existing problem.[7]

Contaminants resuspended from the bottom of the Channel may increase contaminant concentrations to levels that could cause fatalities among aquatic organisms. Contaminant concentrations below lethal levels pose the risk of accumulation of those contaminants in aquatic organisms (bioaccumulation).[8] Bioaccumulation of contaminants results when contaminants are absorbed into living tissues. The absorbed contaminants can exist at concentrations low enough not to kill the organism itself, but if ingested in quantity by a higher organism (large fish eating small fish), that resulting concentration would increase progressively. Concentrations eventually could be increased to levels sufficient to damage or destroy larger aquatic life (e.g., sea lions). As previously discussed, the degree of sediment resuspension could be reduced through the use of shallow-draft tugboats moving at slow speeds (see V.F. Water Quality and Aquatic Ecology, p. V.66).

Bulkhead Repairs

Construction activities would generate debris and toxic waste that may affect water quality if they enter China Basin Channel. Debris generated on the landside of the construction site would be managed under the SWPPP which would be prepared for the site. The SWPPP would identify housekeeping practices that address appropriate handling and disposal of construction debris. However, debris generated during bulkhead repairs may fall directly into the Channel, causing bioaccumulation impacts similar to those previously discussed. Toxic materials may be present in drain pipes proposed for removal.

The bulkhead is a steel and concrete structure forming the north side of China Basin Channel. The walkway deck on the bulkhead, as well as portions in contact with the water, are corroding and need repair so that the bulkhead can provide adequate structural support for the proposed ballpark. The proposed bulkhead repairs would include general repair work, installation of a corrosion protection system, and structural strengthening of the bulkhead.[9] General repair work would consist of the following components:

- Removal and replacement of reinforced concrete along the length of the pier.
- Removal of existing drain pipes (about 120) and deteriorated concrete and corroded material, and plugging of the drain hole with concrete.
- Cleaning concrete surfaces by sandblasting, acid washing, or other methods, and patching areas and cracks by filling with cement grout.

The corrosion reduction system for the steel and concrete bulkhead would include the following components:

- Removal of upper 6 inches of existing pavement and surfacing materials (approximately 18,000 square feet [sq. ft.]).
- Application of new waterproofing to the top surface of the concrete pier.
- Installation of new surface drainage system connecting to the City's combined sewer system.

- Chipping of concrete cover to expose underlying reinforcing steel for installation of copper wire connections between existing steel and new zinc surface coating.
- Cleaning and preparation of all concrete surfaces by sandblasting, acid-washing, or other methods.
- Application of zinc paint sprayed on all exposed concrete surfaces above mean lower low water (MLLW)[10].
- Installation of cathodic protection system including a submerged anode connected by a cable to the reinforcing steel above the waterline and to pier-mounted rectifiers at each caisson.

Structural strengthening of the bulkhead would consist of the following components:

- Increasing soil density behind bulkhead by placing compacted gravel fill in a network of vertical holes along the entire length of the bulkhead.
- Replacing damaged foundation components (slab-on-grade, sheet piling, tie-beams, and anchors).
- Joining the ballpark's new pile-supported foundation system to the existing bulkhead.

All structural strengthening work would be performed on the landside of the bulkhead and would pose no potential for water quality impacts.

Construction Debris

Debris resulting from the bulkhead repairs could include concrete fragments, steel particles, sand, and wet cement grout. Debris would be produced during removal of concrete and steel from the bulkhead structure. Concrete and steel pieces falling into the water would not pose water quality concerns for toxicity, but may pose physical concerns for disturbance of bottom habitat. Large pieces of debris falling into the water may disturb or kill aquatic organisms as they fall and land on the Channel bottom, depending on how much debris drops in the water, the size of the debris, the length of exposure to pieces falling in the water, and the frequency

of debris being dropped. Debris may ultimately benefit the Pacific herring by creating more rocky substrate for egg-laying.

Pieces of debris smaller than sand-size may result from very fine grains of concrete, or other sand particles used in sand-blasting activities. These particles may be suspended in water, causing turbidity (see the previous discussion on turbidity effects). Other construction debris that may contribute to suspended sediment include wet cement or grout that could be spilled into the water during its application. The cement or grout could dissipate in water and cause turbid conditions. As discussed previously, deposition of suspended sediment during the Pacific herring spawning season may smother eggs or may cause fish to grow abnormally. Mitigation measures to prevent the discharge of construction debris are in V.F. Water Quality and Aquatic Ecology, p. V.68.

Toxic Materials

Approximately 120 36-inch-long drain pipes would be removed from the pier deck. Other than corroded and rusted material surrounding the pipes, which are not toxic, there is no potential for those pipes to contain other toxic materials. However, one of the pipes to be removed is connected to the floor drains in the Pier 46B building that discharged to the Channel at one time.

The Pier 46B building historically housed industrial businesses where various toxic materials were used. The floor drains were closed and the discharge pipe abandoned, but toxic materials may be present in the discharge pipe. If present, toxic materials may enter the Channel through accidental spills during removal of the pipe. As discussed previously, spills of toxic materials could either harm or kill aquatic wildlife, or could pose bioaccumulation concerns. See V.F. Water Quality and Aquatic Ecology, p. V.68, for mitigations to prevent spills of toxic materials during removal of drain pipes from the bulkhead.

Another toxic material associated with the bulkhead repair work is the waterproofing sealer that would be used on the pier deck. After the existing pavement on the pier deck is removed, the pier deck would be covered with a thin rubber membrane, about 60 millimeters thick. New concrete surfacing would be poured on top, and a clear liquid waterproofing sealer would either be rolled or sprayed on the surface. Spills would be toxic to Channel organisms. The SWPPP required for the project would include a hazardous material spill control program (see p. IV.310).

Corrosion Reduction

Exposure to saltwater corrodes steel and concrete. Corrosion reduction systems typically are used on steel or concrete structures that come into contact with seawater, such as ships, seawalls, and bulkheads. The existing bulkhead does not have a corrosion reduction system in place and is heavily corroded, necessitating the proposed repairs.

The proposed corrosion reduction system would reduce corrosion by attracting electrical ions in seawater to sacrificial anodes attached underwater at the mudline of the bulkhead. Sacrificial anodes are small rods of metal (usually copper) up to several inches in diameter and several feet long, depending on the amount of time the anode is to remain in place; larger anodes last longer. The anodes are "sacrificial" because they corrode faster than the steel and concrete materials of the bulkhead. The anodes would last several years to several decades before requiring replacement. The exposed portions of the bulkhead would need to be repaired or replaced less often, thus minimizing disturbance associated with in-water maintenance activity.

Zinc Coating for Corrosion Mitigation System

In addition to installation of sacrificial anodes, the bulkhead also would be galvanized by application of a zinc coating to exposed steel surfaces. Concrete fragments that are chipping away would be removed from the bulkhead in order to expose the underlying steel before application of the zinc coating. Concrete removal probably would be performed through a combination of sand-blasting and acid-washing. Sand-blasting roughens the surface of the steel and creates more surface area for the zinc coating to bond, and acid-washing uses a weak solution of hydrochloric acid to remove organic material.

The zinc would be arc-applied to the bulkhead. Arc application involves a current that is run through two zinc rods, melting the zinc. Molten metal is blown onto the bulkhead as a fume. The molten zinc fuses with the steel surfaces of the bulkhead upon contact.

The zinc coating system would be applied either from platforms floating in the water or from scaffolding suspended from the top of the bulkhead walkway deck. Zinc would be applied between the top of the bulkhead to MLLW. There would be no limit on the time of year that zinc coating could be performed in the area between the top of the bulkhead to the waterline. Application of zinc between the waterline and MLLW would be accomplished during spring tides when the lowest of the low tides would occur. Spring tides occur at the new moon and full moon of each lunar month.

As discussed previously, contaminants, including metals such as zinc, are bioaccumulated in organisms by being ingested by larger and larger animals. In small amounts, metals are essential to normal biochemical functioning of aquatic biota. In high amounts, metals may have adverse effects such as interference with respiration, kidney failure, altered biochemical function and suppression (or elevation) of immune responses. If the working area were not enclosed, zinc particulates could enter the Channel water through excess spray and over-drift. Association of zinc particulates with sediment at the Channel bottom would expose organisms

to zinc and could induce zinc bioaccumulation. Although studies indicate that zinc is well-regulated by most organisms, concentrated amounts of zinc would have adverse effects such as those previously described.[11] Application of zinc to the bulkhead probably would not be a substantial source of zinc to sediments by itself, but would add to existing levels of zinc in the sediment.

Turbidity Impacts from Pile-Driving

A new pile-supported concrete pier of approximately 2,400 sq. ft. is proposed at the southeast corner of the proposed Port Walk. This pier would link the east end of Pier 46B with the south end of the seawall on The Embarcadero at South Beach Harbor, allowing continuous pedestrian access between the Port Walk and promenade (Herb Caen Way) at the marina. An existing timber pier would be removed to accommodate the new concrete pier. Wooden piles would be cut 5 ft. below the existing pier deck, above the mean high water line.

Except for this portion of the project, all pile-driving for the proposed ballpark would occur on land, with no water quality impacts. See the Ferry Service Variant in Chapter VII, Variants to the Project, pp. VII.1 - VII.9, for a discussion of pile-driving associated with construction of the ferry terminal. Approximately 16 precast concrete piles would be driven through water into a stable soil or rock formation beneath the bottom of the Channel. Concrete is not subject to decomposition like wooden piles would be, and the concrete piles would not be treated with anti-biofouling material. Pile-driving would be performed from a barge (see previous discussion of Turbidity From Barge and Tugboat Activity, pp. IV.311 - IV.312). Pile-driving would permanently eliminate all benthic organisms at each pile location. More mobile organisms could relocate away from the construction area and would not be affected if pilot holes for the piles were pre-drilled, the piles would be lowered into the holes, reducing the amount of vibration necessary to place the piles. The turbidity

created by the drilling of the pilot holes would be less than the turbidity created by pile-driving without pilot holes. During pile-driving sediments would be disturbed, producing a short-term increase in turbidity. Thus, pile driving could cause deposition of sediment that could be injurious to Pacific herring eggs, if it occurred during the spawning season. The piles would provide permanent new habitat for attached organisms and possibly spawning habitat for the Pacific herring. Turbidity effects would be as discussed previously. The permanent shading caused by the new 3,400-sq.-ft. pier area would make conditions under the structure less conducive to photosynthesis.

Disruption of Aquatic Wildlife

As discussed in III.J. Water Quality and Aquatic Ecology, p. III.172, California sea lions and harbor seals forage in China Basin Channel. Because they are protected under the federal Marine Mammal Protection Act, any disturbance to sea lions and harbor seals is prohibited. Ballpark construction activity including the use of barges and tugboats along the Channel could pose the threat of disturbance. However, existing use of Pier 46B by tugs docking and departing and the passage of pleasure craft do not appear to interfere with sea lion or harbor seal movements.[12] This is consistent with the habits of California sea lions and harbor seals of maintaining normal behavior adjacent to heavy boat activity throughout the San Francisco waterfront area. Therefore, ballpark construction activity is not expected to disturb sea lions or harbor seals. Birds such as gulls, egrets, cormorants and pelicans that occur in the area are also adapted to human activities, and would not be substantially disturbed by construction activities.

Spread of Groundwater Contamination from Well Point WP-06

As described in III.J. Water Quality and Aquatic Ecology, p. III.178, a number of contaminants including benzene, toluene, ethylbenzene, total xylenes, and phenolic compounds occur at elevated concentrations in the northern portion of the site at King Street at well point WP-06. The contaminants appear to be bound to organic materials associated with coal tar in the soil. Changes in groundwater levels or flow direction north of Berry Street may induce the spread of groundwater contamination by mobilizing the contaminants. Groundwater north of Berry Street generally flows toward the center of the site in the direction of the existing sewer under Berry Street. The project may affect groundwater levels and flow directions north of Berry Street 1) through plugging of the existing sewer along Berry Street, and 2) through dewatering activities associated with excavation for the batting cages and underground walkway.

The existing 2-foot-6-inch by 3-foot-9-inch sewer on Berry Street is proposed to be capped on either end (at Second Street and Third Street) and left in place. The sewer between Second Street and Third Street would be filled with cement and sand grout or an equivalent material to prevent possible collapse of the sewer. Plugging the sewer with an impermeable material such as grout could cause groundwater levels on the north side of the sewer (north of Berry Street) to rise to an elevation corresponding to the groundwater elevation beneath the Port property south of Berry Street because groundwater would no longer readily infiltrate into the sewer. As discussed in III.J. Water Quality and Aquatic Ecology, p. III.178, the organics in the coal tar near the most concentrated area of contamination are binding the contaminants to the soil, limiting the effect on groundwater and extent of migration. Although no migration of contaminants appears to be occurring because of the strong binding effect of the organics, a sharp rise in the groundwater level at that location could mobilize those contaminants.

Dewatering proposed during construction also may induce mobilization of the contaminants. Three batting cages and an underground walkway are proposed under the left-field line,

which roughly parallels King Street. Soil would be excavated to an approximate depth of 14 ft. below existing grade to construct the batting cages and probably would need dewatering during construction.

The dewatering needed during construction of the batting cages in the central portion of the site near Berry Street could have temporary effects on groundwater flow directions at the site and probably would change flow directions in the area of concentrated contaminants toward the batting cage dewatering area. It is possible that a steep gradient change in flow directions during dewatering could mobilize dissolved hydrocarbons in groundwater in the vicinity of well point WP-06, thus expanding the existing area of contamination despite the strong adherence of the chemicals to the organics in the soil.[13]

Based on the *Site Investigation Report and Risk Evaluation* performed for the project, the RWQCB would require the project sponsor to monitor the area near well point WP-06 during dewatering to assess whether the extent of the chemicals in groundwater is being affected. Prior to initiating dewatering activities, the RWQCB would require the installation of a groundwater monitoring point between well point WP-06 and the dewatering area. Data on existing groundwater quality would be collected at the monitoring point to establish baseline conditions. Initially, the RWQCB would require sampling to be performed frequently (about once a week or once a month), with monitoring reports submitted to the RWQCB. If the results show that dewatering may be affecting the extent of the contamination, based on comparing monitoring data with baseline data, the RWQCB would determine the necessary subsequent actions. Those actions might include stopping dewatering, determining how the plume could be contained, or specifying a different location for dewatering.

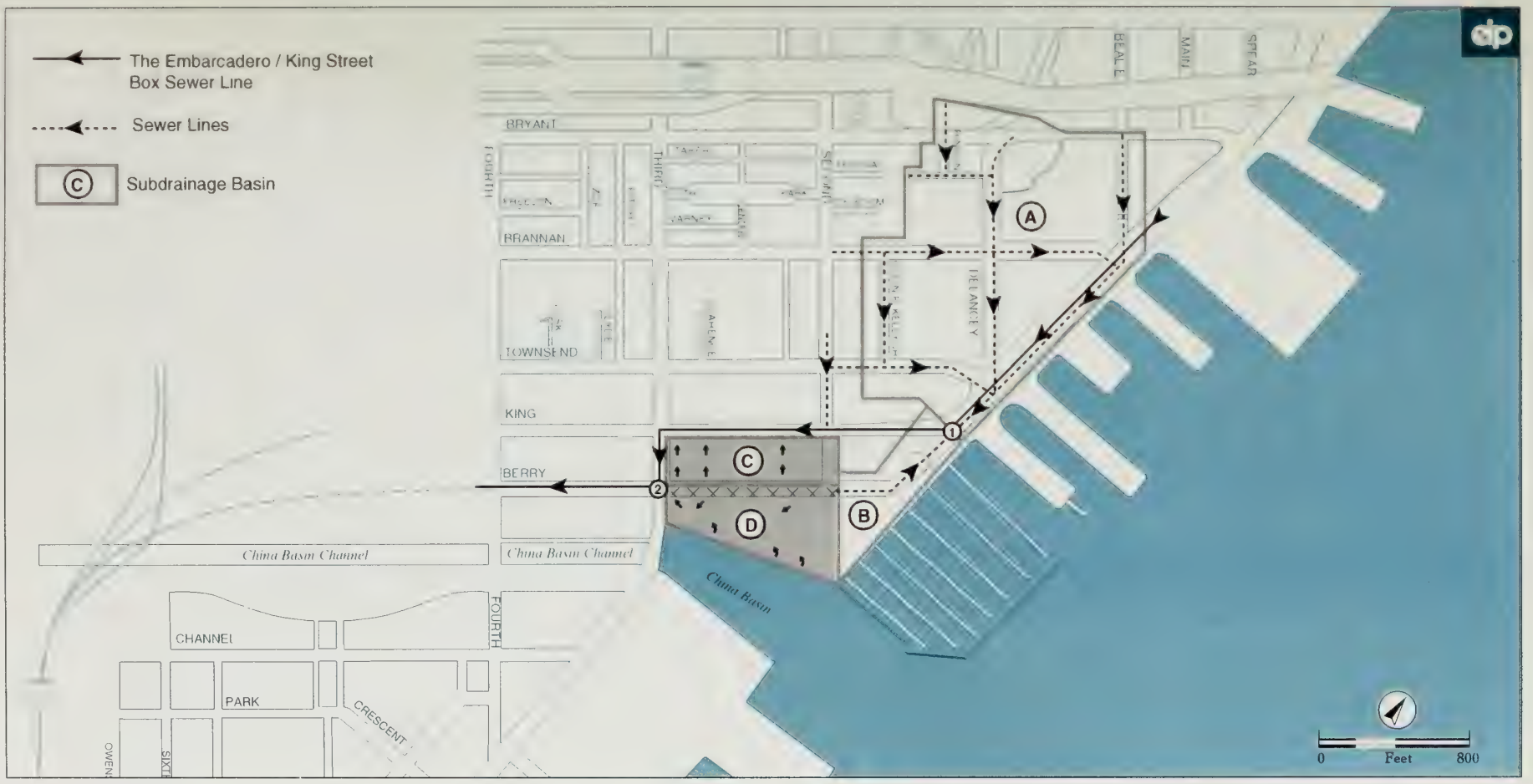
IMPACTS OF BALLPARK OPERATION

Sewer Capacity

- The sewers east of the ballpark site would be re-routed to allow abandonment of a portion of the Berry Street sewer that passes directly beneath the ballpark site. As discussed below, the sewer re-routing and the new volume of storm water contributed by the proposed ballpark would not substantially decrease sewer capacity in the local area and would not increase the frequency of existing sewer back-ups in the South Beach area or change the frequency of overflows at Third Street into China Basin Channel, which currently is less than three times a year. Drainage improvements would be provided for the South-of-Channel parking areas, but no specific drainage design is yet available. See V.F. Water Quality and Aquatic Ecology, p. V.70, for measures addressing drainage improvements for those areas.

- As previously discussed in III.J. Water Quality and Aquatic Ecology, p. III.174, sewer flows from Area A are to be re-routed in the 2-foot-6-inch by 3-foot-9-inch Berry Street sewer upstream of The Embarcadero and King Street intersection, by connecting into the higher-capacity 17.5-ft. by 30-ft. Embarcadero/King Street box sewer at point 1 as shown on Figure IV.J.1. Flow from Area B will continue to be captured in the Berry Street sewer, but the direction of flow in the Berry Street sewer between Second Street and King Street will be changed from a westward direction to an eastward direction and will connect into The Embarcadero/King Street Box sewer at point 1. Flows on the northern part of the ballpark site (Area C) would continue to be collected by sewers in King Street. After the flows upstream of the ballpark site are redirected into The Embarcadero/King Street box sewer, the portion of the Berry Street sewer within the ballpark site (from Third Street to Second Street) would be capped on both ends, filled with grout, and abandoned in place, and would no longer accept flow.

- Flows from the remainder of the ballpark site (Area D) would be routed by new internal infrastructure to a collection point near the Berry Street and Third Street intersection, where



SOURCE: Olivia Chen Consultants, 1997

GIANTS BALLPARK

● **Figure IV.J.1 Wastewater Flow Pattern After Sewer Re-Route**

it would discharge into the Berry Street sewer and would be conveyed south toward the Southeast Water Pollution Control Plant for treatment. The frequency of overflows at the Third Street overflow outfall would not increase. A substantial drainage area would be diverted away from draining into the Berry Street sewer, reducing flows into the Berry Street sewer. Flows from Area B also would no longer flow westward in the Berry Street sewer because flows would be re-directed along a portion of the Berry Street sewer into The Embarcadero/King Street sewer, which is a large-volume transport/storage facility. Storm water is detained in this box sewer before it is pumped south to the Southeast Water Pollution Control Plant. During high-volume rainfall events when the storage capacity of the King Street box sewer is exceeded, overflows could occur at overflow structures into the Channel and at Pier 34 into the Bay, but this would be no different than what presently occurs.

As previously discussed on p. IV.308, about 6 acres of the ballpark site south of Berry Street do not presently contribute storm water to the City's sewer. The 6 acres south of Berry Street would be occupied by part of the ballpark structure, most of the playing field, and the proposed Port Walk. All storm water falling on this area would be collected and conveyed to the City's sewer. As discussed below, the playing field would act in conjunction with the upstream King Street box sewer as a detention basin to further offset the additional volume of storm water into the Third Street sewer.

The playing field would have a subdrainage system that would direct infiltrated storm water to the City's sewer. The subdrainage system would be underlain by a geotechnical fabric for seismic reasons (see IV.H. Seismicity, p. IV.283). The system would consist of approximately 30 inches of material. The playing field surface would be sod underlain by about 1 ft. of soil. Under this layer, an interconnecting system of 4-inch drain pipe would be placed. Excess water from irrigating the playing field and rain water that infiltrates through the playing field would be collected by the pipes. Gravel drainage material would be placed around the pipes. The subdrainage system would be connected to the City's combined sewer system.

The playing field would add more storm water to the City's sewer because it would replace the area south of Berry Street which presently drains directly to the Channel without entering the City's sewer system. The underlying soil in the playing field would hold rain water up to a certain amount during storms. Depending on a number of factors, such as the duration and intensity of rainfall and the degree of saturation of the playing field, storm water might not immediately enter the sewer system. Additionally, storm water or irrigation water on the playing field would be taken up by turf grass and would evaporate, instead of entering the City's sewer system. Therefore, the playing field in conjunction with re-routing flows upstream of the ballpark into the King Street box sewer would essentially control the timing of storm water entering the sewer at Third Street and would not substantially change the frequency of overflows at the Third Street overflow structure.

Potential Changes in Quality of Drainage

The ballpark site would have new sewers and connections to the City's combined sewer system, so that no portion of the ballpark site would discharge to the Channel without treatment. Because land uses on the ballpark site would change from industrial/maritime to commercial/entertainment, the types of potential pollutants found in storm water would change from pollutants such as oil and grease, heavy metals, and paint chips, to pollutants in non-storm discharges from the site such as fertilizers in excess irrigation water from the playing field. Chemicals used on the playing field mainly would consist of fertilizers for lawn growth and of lime (calcium carbonate) for drawing foul lines, with some limited use of pesticides. Fertilizer chemicals leaching through the soil column would be collected by the proposed subdrainage system and would be removed at the Southeast Water Pollution Control Plant.

Drainage from the parking areas south of the Channel would contain typical urban pollutants such as oil and grease, heavy metals, metals from car brake pads, glycol, and antifreeze. If

storm water from the parking areas containing these pollutants drains directly into the Bay with little or no treatment, the amount and type of pollutants would be similar to that generated by similar urban areas in the San Francisco Bay region. Drainage improvements would be provided for the parking areas, but no specific drainage design is available. A mitigation measure on p. V.70 requires that drainage improvements for the parking areas be designed such that all drainage from the parking areas be collected for treatment before discharge into the Bay.

As described in III.J. Water Quality and Aquatic Ecology, p. III.167, overflows from the City's combined storm water/sewer system occur during high-volume rainfall when the amount of

combined flows exceed the storage and treatment capacity of the facilities. Pollutants and sewage in the overflows are diluted by as much as 10:1 by rain water. Storm water flows from the ballpark site could contain fertilizers and lime from the playing field. Because fertilizer application would be limited to the amount calculated to be used by the turf grass, and because the remaining amount would be diluted substantially by rain water volumes both from the project site and from the rest of the area's sewer flows, the contribution of fertilizer from the playing field to pollutants in sewer overflows to the Bay would be minimal.

Storm Water Permitting

As described in III.J. Water Quality and Aquatic Ecology, p. III.166, storm water on waterfront industrial-use areas is discharged under a General Industrial Activities Storm Water Permit. The ballpark would be connected to the City's combined sewer system and would not require a separate storm water permit. Storm water from the ballpark would be treated and discharged under the existing individual NPDES permit for the Southeast Water Pollution Control Plant. In addition, the ballpark would not meet the State Water Board's definition of an industrial use and would not be subject to storm water requirements for industrial uses. However, as discussed previously, the project would require a General Construction Activity Storm Water Permit during construction activities.

Changes in Tidal Influence South of Berry Street

Groundwater levels south of Berry Street under the Port property move up and down with the tide. Proposed compaction of loose soils behind the bulkhead to provide structural strengthening for the ballpark structure would reduce the space between soil particles for groundwater, reducing the response of the groundwater level to tidal movements.

If the Berry Street sewer were to be removed, groundwater across the site might become fully hydrologically connected. If a steep rise in the groundwater flow gradient causes contaminants north of the Berry Street sewer to mobilize, the contaminants could spread into the area south of the Berry Street sewer. However, the Berry Street sewer is proposed to be capped and left in place. Therefore, groundwater south and north of the Berry Street sewer would continue to function as separate units with no substantial hydrologic connection, and there would be no potential for contaminants north of the sewer to migrate to the area south of the sewer and into the Channel.

As discussed in III.I. Contamination and Environmental Risk, p. III.161, a risk analysis was performed to determine whether groundwater contaminants on the site could pose any risk to aquatic organisms by migration of those contaminants into the Channel. The analysis concluded that the concentrations of chemicals found in the site's groundwater are representative of concentrations that might be found in the general area surrounding the site. Thus, if contaminants in the groundwater were migrating into the Channel, the contaminants would not pose a greater risk to aquatic organisms than what already occurs in the area. In addition, the expected reduction of tidal water and groundwater exchange from compaction of soils behind the bulkhead could further reduce the potential of migration through tidal exchange. Therefore, changes in the groundwater level caused by soil compaction behind the bulkhead would not add contaminants to the Channel. The project would not place aquatic organisms at more risk (see III.I. Contamination and Environmental Risk, pp. III.161 - III.162, for further discussion of the conclusions of the risk analysis).

Litter Control for Ballpark

Because of the ballpark's proposed location adjacent to China Basin Channel and San Francisco Bay, litter generated during events at the ballpark may be inadvertently blown or dropped into waters, thereby creating potential choking and feeding hazards to aquatic organisms foraging at the mouth of the Channel and in the Bay. Litter floating in waters

also would be inconsistent with the Basin Plan water quality objective that "waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses."[14]

Litter generated at ballpark-associated areas on the waterfront would have the highest potential to enter the Channel and Bay. Those areas include the Port Walk, the Lefty O'Doul and Peter Maloney Bridges that pedestrians would cross, and the South-of-Channel parking lots that would be dedicated for ballpark use. Pedestrians on the Port Walk and bridges may inadvertently drop trash directly into the Channel or not properly dispose of it, in which case it may be blown into the water. Potential tailgate parties occurring at the South-of-Channel parking lots could also generate trash, and depending on the weight of the material, could be blown into the Channel and Bay. See V.F. Water Quality and Aquatic Ecology, pp. V.69 - V.70, for mitigation measures to control litter outside of the ballpark.

NOTES - Water Quality and Aquatic Ecology

1. Robert Tasto, Environmental Specialist Supervisor, California Department of Fish and Game, telephone conversation, February 4, 1997.

2. State Water Resources Control Board, General Construction Activity Storm Water Permit, adopted August 20, 1992.

3. Storm Water Quality Task Force, *Construction Best Management Practices Handbook*, Volume 3: California Storm Water Best Management Practice Handbooks, March 1993.

4. Letter from Loretta K. Barsamian, Executive Officer, and Steve Morse, Chief, Toxics Cleanup Division, San Francisco Bay Regional Water Quality Control Board, to John Yee, San Francisco Giants, Re: Approval of Site Investigation Report and Risk Evaluation at Giants Pacific Bell Park Site, San Francisco, California, File No. 38S0045, November 25, 1996.

5. a) Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California*, Volume 1, prepared for China Basin Ballpark Company, LLC, San Francisco, California, October 1996.*

   b) Geomatrix Consultants, Inc., *Soil Management Plan*, prepared for China Basin Ballpark Company, LLC, San Francisco, California, November 1996.*

6. Bob Battalio, Project Engineer, Moffatt & Nichol Engineers, memorandum to Consultant Team, re: Concept Layout - Passenger Ferry Berth, China Basin, Giants Stadium - Downtown San Francisco, December 31, 1996.

7. Aquatic Habitat Institute, Philip Williams & Associates, Ltd., *Status and Trends Report on Dredging and Waterway Modification in the San Francisco Estuary*, San Francisco Estuary Project, March 29, 1990.

8. San Francisco Estuary Institute, *Local Effects Monitoring Study*, prepared for Bay Area Dischargers Authority, 1994.

9. Rutherford & Chekene, Consulting Engineers, *Pacific Bell Park Pier 46B Bulkhead Repairs and Structural Strengthening*, revised December 19, 1996.

10. Mean lower low water (MLLW) is the average height of the lower of the two low tides each day. Similarly, mean higher high water (MHHW) is the average of the two higher daily highs.

11. Aquatic Habitat Institute, Philip Williams & Associates, Ltd., *Status and Trends Report on Dredging and Waterway Modification in the San Francisco Estuary*, San Francisco Estuary Project, March 29, 1990.

12. Joseph O'Connor, Ph.D., observations made on August 19, 1996.

13. Geomatrix Consultants, Inc., *Site Investigation Report and Risk Evaluation, Giants Pacific Bell Park Site, San Francisco, California*, Volume 1, prepared for China Basin Ballpark Company, LLC, San Francisco, California, October 1996, p. 31.*

14. San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Basin (Region 2), *Water Quality Control Plan*, June 21, 1995.

* A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

K. GROWTH INDUCEMENT

This section discusses the ways in which the project and foreseeable activities fostered by the project might encourage and facilitate other activities that would induce growth, and the potential physical impacts of such potential development.

EMPLOYMENT, POPULATION AND HOUSING

The proposed project includes demolition of buildings, which would require all uses to relocate to a new site or discontinue the particular business or activity. Those businesses choosing to relocate would most likely continue to employ the same number of workers, but at a different location. As discussed in Appendix A, Initial Study, pp. A.16 - A.19, this would result in the relocation of employees now engaged in light-industrial and maritime industries at the project site to other areas of San Francisco.

Independent of the project, the Port of San Francisco is scheduled to relocate its Maintenance Operations Facilities prior to the development of the ballpark. With the exception of expanded employment as noted, this would change only the location of these jobs within San Francisco, and not the number of jobs.

The employment related to the new use of the site would be filled predominately by current baseball game-day employees at 3Com Park. The project would create new jobs in the Pavilion Building and at the centerfield restaurants.

It is estimated that an adequate construction workforce is available in the Bay Area to build the project. Therefore there would be no growth-inducement as a result of this factor.

The Initial Study (see Appendix A) considered the potential population-inducing characteristics of the project and concluded that the project would not directly induce

population growth. It would not increase the capacity of community service facilities or expand such facilities to new areas. It would not substantially increase on-site employment, or demolish or construct housing, and therefore would not substantially change demand for housing.

POTENTIAL GROWTH IN SURROUNDING AREAS

The ballpark project is proposed as an expansion of the *Rincon Point-South Beach Redevelopment Plan Area* just north and east of the site. Redevelopment efforts over the past 10 to 15 years have resulted in removal of blight and the evolution of a thriving commercial and residential neighborhood. Redevelopment of the proposed ballpark site would continue and potentially intensify this trend.

Development of the ballpark would add a regional special event center to a waterfront location now dominated by industrial uses. The use of the ballpark and the ballpark's commercial facilities could encourage greater periods of activity in the area and could generate an additional demand for restaurants, bars and retail establishments. Activity at existing commercial businesses would increase, and new businesses catering to ballgame attendees would develop.

The "urban ballparks" of recent years (i.e., the project, Coors Field, Jacobs Field, etc.) encourage redevelopment by maximizing the use of existing infrastructure. Giants ballpark attendees, including downtown workers during the week, would be expected to patronize the local area before and after ballgames. Since public transit is available, a number of ballpark attendees would walk through the vicinity before and after the ballgames. The potential presence of up to 42,000 people in the area for an event would encourage the growth of pedestrian-serving uses in the neighborhood (see IV.B. Land Use, pp. IV.22 - IV.23, for further discussion).

Coors Field in Denver and Jacobs Field in Cleveland are two examples of ballparks located in underutilized areas which have had an impact on redevelopment areas. Prior to the construction of Coors Field, Denver's Lower Downtown District was a largely industrial and underutilized area characterized by long-standing small neighborhood-serving businesses and moderate housing prices.[1] Cleveland's lower downtown was similarly occupied by older underutilized buildings and vacant land.[2] Within a seven-block radius, Coors Field, which opened in March 1994, has fostered the development of restaurants, bars, "brew-pubs" and other pedestrian-related uses, and the area has experienced an increase in the cost of housing. The Jacobs Field area in Cleveland has also seen the development of new restaurants, bars, residential and office space since the ballpark opened in April 1994, along with Gund Arena.

As in Denver and Cleveland, it is likely that the project would foster the development of new business in the project vicinity. To the extent that the project, and other projects in the planning stages,[3] would not provide enough facilities for the increased demand for commercial services, such as restaurants, bars, and retail establishments, demand would increase the patronage of existing uses. Such demand could be substantial and generate demand for further new development. Thus, the ballpark could intensify the pace and change the type of future growth.

The ballpark is located at the southern end of a series of piers and land-side parcels (known as seawall lots) south of the Bay Bridge that are within the purview of San Francisco's Port Commission. The Port Commission has prepared a long range land use plan for its property (the *Draft Waterfront Land Use Plan*).[4] Land use recommendations for this area include increased open space and public access areas, a possible cruise terminal or other water-oriented mixed use developments that will promote the public use and enjoyment of San Francisco Bay. The Draft WLUP permits restaurants and bars and other commercial/retail uses within mixed use developments that have an overall maritime or water-oriented character. A portion of the increased demand for these uses generated by the ballpark could, therefore, be met through development of Port property.

The City and County of San Francisco recently completed a program EIR for the *Draft Waterfront Land Use Plan* which considered the effects of new development and increased activity levels on Port property, including the area in the immediate vicinity of the ballpark. The ballpark project, however, may accelerate the time frame in which there is a market demand for the redevelopment of Port property along the pedestrian, transit and vehicular thoroughfares leading to the ballpark. Although the use restrictions on Port property are greater than for privately held land, the Port could capitalize on the game and event day activity with its planned new development and public access improvements on Port property, increasing the potential for public use and enjoyment of San Francisco Bay.

The project site is at the southern end of an established retail, commercial, office and residential neighborhood. The neighborhood-serving establishments north of the project site could encounter a tighter market for commercial space as demand for ground-level space intensifies, with attendant pressure on rental rates. It is uncertain whether there would be development of new facilities in the South of Channel area since pedestrian access is minimal and the portions of that area nearest to the project site are planned for cargo-related maritime use and interim dedicated parking to serve the ballpark.

A regional commercial/entertainment center such as that proposed nearby in Mission Bay north of the Channel by Catellus Development Corporation, which would include a multiplex cinema and commercial development, would be expected to expand the market for complementary eating and retail establishments. Thus, retail and commercial space proposed for the Catellus property may capture a substantial share of new demand for such services induced by the presence of the ballpark.

It is expected that ballgame fans and other event patrons would increase and lengthen the amount of nighttime activity in the area. In addition to generating increased demand for retail services generally, this also would encourage new liquor license applications for

restaurants, sports lounges and bars. Since few such amenities exist in the immediate neighborhood, it is expected that some current uses would be converted to accommodate the demand.

The increase in activity in the project area related to increased neighborhood-related activities could create additional noise and litter effects in the project area before and after games and other events, which occur to a large extent in the evening hours. Litter at the ballpark and in the ballpark parking lots is discussed in IV.J. Water Quality and Aquatic Ecology, pp. IV.327 - IV.328.

Noise effects from nighttime activity associated with ballgames and other events, however, would appear to be minimal compared to the amount of noise generated during the ballgame. The effects of ballpark noise and traffic noise on adjacent areas is discussed further in IV.F. Noise, pp. IV.237 - IV.263.

NOTES - Growth Inducement

1. Barbara Chadwick, Planning Program Manager, Office of Planning and Development, City of Denver, personal communication, January 9, 1997.

2. Linda Hendrickson, Chief City Planner, Department of Planning, City of Cleveland, personal communication, February 4, 1997.

3. The North of Channel project proposed by Catellus Development Corporation would consist of up to 3,000 dwelling units and 600,000 square feet of entertainment/commercial space. The commercial space is proposed to include a multiplex cinema and other destination entertainment uses. The South of Channel area is also one of three potential University of California San Francisco major new campus sites; the new campus would include 2.65 million gross square feet.

4. Port of San Francisco, *Draft Waterfront Land Use Plan*, July 26, 1994, and as amended January 24, 1995.

V. MITIGATION MEASURES PROPOSED TO MINIMIZE POTENTIAL ADVERSE IMPACTS OF THE PROJECT

In the course of project planning and design, measures have been identified that would reduce or eliminate potential environmental impacts of the proposed project. Some of these measures have been, or would be, voluntarily adopted by the project sponsor or project architects and contractors and thus are proposed, and some are under consideration. Implementation of some may be the responsibility of other agencies. Measures under consideration may be required by agencies as conditions of project approval, if the project were to be approved. Each mitigation measure and its status is discussed below.

There are several items required by law that would serve to mitigate such impacts; they are summarized here for informational purposes. An example of such measures is preparation of a Storm Water Pollution Prevention Plan to control potential erosion and sedimentation.

Measures which are not required by legislation but which would also serve to mitigate environmental impacts appear below. Mitigation measures preceded by an asterisk (*) are from the Initial Study (see Appendix A, p. A.49)

A. VISUAL QUALITY AND LIGHTING

PARKING AREA LIGHTING

Measure Not Included as Part of Project

The parking area lighting should be designed to minimize off-site glare. The design could include 45-degree cutoff angles on light fixtures to focus light within the site, and specifications that spill lighting from parking areas would be 0.25 foot-candle or less at 5 ft. from the property line of the parking areas.

B. TRANSPORTATION AND CIRCULATION

INTRODUCTION

This section presents the transportation mitigation measures that were developed to mitigate the impacts of the project as identified and described in IV.E. Transportation and Circulation. In some cases the mitigation measures could cause impacts of their own, and these are identified, and further mitigation is discussed.

The mitigation measures recognize the special nature of the transportation activity related to a special events facility such as the ballpark. These considerations include:

1. Baseball games at the ballpark would occur approximately 81 days out of the year. While this analysis takes a very conservative approach and addresses a sellout condition, attendance forecasts prepared for the Giants suggest that fewer than 37 percent of the games (about 30 games per year) would be sellouts (42,000 seats) and that under sellout conditions, attendance would be approximately 39,500 (assuming a conservative 6 percent "no-show" factor). There is also the potential for up to five special events each year which might exceed the 42,000 seating capacity. This chapter identifies measures that could be implemented for such events. Other events might also be held using less than the ballpark's proposed seating capacity, including the following:

   - up to 20 open-air events (15,000 to 42,000 persons);
   - additional smaller open-air events (fewer than 15,000 persons); and
   - 30 to 40 music events in a temporary enclosed amphitheater (5,000 to 15,000 persons)

   The project sponsor has agreed that when these events occur on a weekday they would not be scheduled to end after 4:00 p.m. or begin before 7:30 p.m. These events could occur on weekdays or weekends. Except for the maximum-capacity events, the impacts of the other events would be similar to those of a ballgame.

2. The planned schedule for weekday night baseball games is purposely designed to avoid the major commute traffic peak period on weekdays. The planned schedule for weekday afternoon games, while dictated somewhat by Major League Baseball rules, is also planned to avoid the commute traffic peak period to the extent possible.

3. The location of the ballpark is such that substantial opportunities would exist for access by private auto, taxi, charter bus, transit (public bus and rail), ferry service, bicycles and by walking.

4. The location of the ballpark also offers the patrons of baseball events access to a broad variety of pre-game and post-game entertainment opportunities in downtown San Francisco.

In developing the mitigation measures for the project, the efforts of other major special event facilities around the country were examined, and the available technical literature and research efforts on special event planning were consulted. The philosophy of special event planning is well characterized in the Eno Foundation Publication, Parking for Institutions and Special Events, which, although published in 1982, remains one of the most often used resources on this topic. The following quote from this publication's introduction to special events planning typifies the special characteristics involved:

> *The very nature of a special event can cause traffic and parking problems. While there are exceptions, most special events attract crowds that arrive over a 60 to 90 minute period, and when the event concludes, the crowd leaves -- typically, all at the same time. Even with the special purpose facilities designed to accommodate special events, the rapid build up of people and their machines, and their more sudden departure after the event, creates potential traffic and parking problems...To prevent or minimize special event traffic and parking problems, the key is smart advance planning.*[1]

It is characteristic of major special events, due to the large numbers of people involved, that a certain amount of delay and congestion will occur. Transportation mitigation measures for such events need to be fashioned so that the flows of people and vehicles can be managed to keep congestion and delay to acceptable levels. Attendees of special events expect to encounter certain levels of congestion, delay, and inconvenience that they normally would not be willing to accept.

This has to be balanced against the potential for inconvenience to persons traveling through the area or to and from other land uses in the area.

In developing the transportation mitigation measures for the project, the transportation improvement and traffic/parking plans developed for Denver's Coors Field[2] and for the San Jose Arena[3] were used as models. Both plans have proved to be successful, and embody the concept of a downtown sports facility that shares the available transportation resources.

- The Giants and the City would be responsible for the development of a similar plan, the Transportation Management Plan (TMP). The TMP should be based upon accepted planning practices and principles with emphasis on incentives for transit, pedestrian, and bicycle modes and disincentives for auto modes. In particular it should encourage downtown employees and visitors to walk, bike, or ride transit to the ballpark, and to leave their cars at home or in existing lots away from the ballpark.

Consistent with the approach outlined above, the mitigation measures described below have been designed to work together to reduce traffic and pedestrian congestion in the ballpark area, aid those who are not traveling to the ballpark to avoid ballpark-related congestion, and further enhance transit use to the ballpark. Implementation would be the responsibility of the project sponsor and the City; oversight and guidance of a specially formed Ballpark Transportation Coordinating Committee, described below, would help in implementation. Some of the components of the mitigation measures described below would require actions by the Board of Supervisors, the Department of Parking and Traffic, the Port Commission or other City agencies.

It is important to note that many of the mitigation measures would involve capital costs of construction and operation and/or ongoing costs of operation and maintenance. For the most part these costs would be experienced by the public or private entities responsible for implementation of the measure. None of the measures is currently programmed in the formal capital and operating plans for Caltrans, the San Francisco Municipal Railway, the San Francisco Department of Parking and Traffic, the Department of Public Works, the Port of San Francisco, or any of the other involved public agencies. The source of the funding for each measure is not necessarily known at this time, but will be identified as part of the project review and approval process.

The measures described below are all under consideration by the project sponsor or are outside the project sponsor's control, except where specifically indicated to be part of the project.

BALLPARK TRANSPORTATION COORDINATING COMMITTEE

A Ballpark Transportation Coordinating Committee should be formed to implement and monitor the operation of the transportation mitigation program. This committee should include, for example, a transportation coordinator from the Giants staff, and representatives from the Department of Parking and Traffic (DPT), the Planning Department, the

- Police Department, MUNI, CalTrain, BART, and the ferry service operators. The committee also could include representatives of neighborhood, special interest groups, and property owners. Care should be taken to avoid creating such a large committee that appropriate actions cannot be taken quickly. A similar committee has been in existence for some time to oversee transportation operations at 3Com Park, and has proven to be very successful.

- The BTCC would have the responsibility of implementing the Transportation Management Plan (TMP). The ultimate objective of the TMP would be the efficient movement of people to and from, and within the vicinity of, the ballpark. Generally, the TMP would include measures to address transportation concerns including transportation demand management, transit use and improvements, pedestrians movement, traffic routing, and mitigation of impacts on area residents and businesses. This section of the EIR identifies a number of transportation improvements that would be representative of the types of measures that the TMP would define and the BTCC would consider for implementation. In addition the BTCC would have the ability to develop other measures as the need arises from time to time. A number of such measures were identified during the course of the preparation of the EIR. These were developed from suggestions made directly by commentors on the EIR or as a potential response to an impact identified by a commentor. These types of measures are summarized on p. V.45 below under Other Mitigation Issues.

TRAFFIC MITIGATION MEASURES

The project would generate significant pedestrian flow impacts on portions of Third Street and King Street, and on the Lefty O'Doul Bridge (Third Street Bridge) adjacent to the ballpark. The project would also require use of substantial portions of these streets to accommodate transit, the bus bridge, taxis, bicycles and other activities related to baseball

fan arrivals and departures. In addition, the Lefty O'Doul Bridge cannot accommodate the combined traffic, transit vehicle, bicycle and pedestrian demands that would exist before and after major ballpark events. As a result, the traffic mitigation measures focus on a strategy to route vehicular traffic away from the area adjacent to the ballpark before and after games to allow street space to be used to provide needed pedestrian and transit capacity. This strategy includes closing King Street and Third Street adjacent to the ballpark and the Lefty O'Doul Bridge to vehicular traffic before and after events. The bridge and Third Street would be open to vehicular traffic during ballgames and events, when project-related traffic volumes would be relatively low. These measures would probably be desirable even if pedestrian flows on the bridge were not expected to exceed sidewalk capacities, as the bridge controls and limits the amount of traffic activity in the immediate vicinity of the ballpark, providing for more efficient and safe pedestrian flow and transit vehicle operation.

Traffic mitigation should include a traffic routing plan both for motorists driving to the ballpark and dedicated ballpark parking south of China Basin Channel and for motorists driving to locations north or south of the ballpark site. The Ballpark Transportation Coordinating Committee should assist in preparing the traffic routing plan and should provide

for adjustments in the traffic routing plan as determined to be needed based on experience with implementation.

Specific features of a traffic routing plan mitigation measure are described below, followed by a description and analysis of a preliminary traffic routing plan for the project. Traffic mitigation measures also include provision of additional transit services, and travel demand management measures that would help to further reduce automobile use by ballpark patrons and employees; these measures are described below, beginning on page V.40.

Traffic Routing Plan

Special traffic routing programs are a common technique for addressing the special needs of major events facilities. A traffic routing plan should be developed for the ballpark to separate project traffic from other traffic in the vicinity of the project site to the extent possible. The traffic routing plan should be developed by the project sponsor and the Ballpark Transportation Coordinating Committee, and should include specific measures listed below, as well as other flexible features such as those described in the preliminary traffic routing plan. These more flexible features would be adjusted, as required, in consultation with the Coordinating Committee, based on operation and implementation experience and based on the expected attendance for each ballgame.

The general goals of the traffic routing plan are as follows:

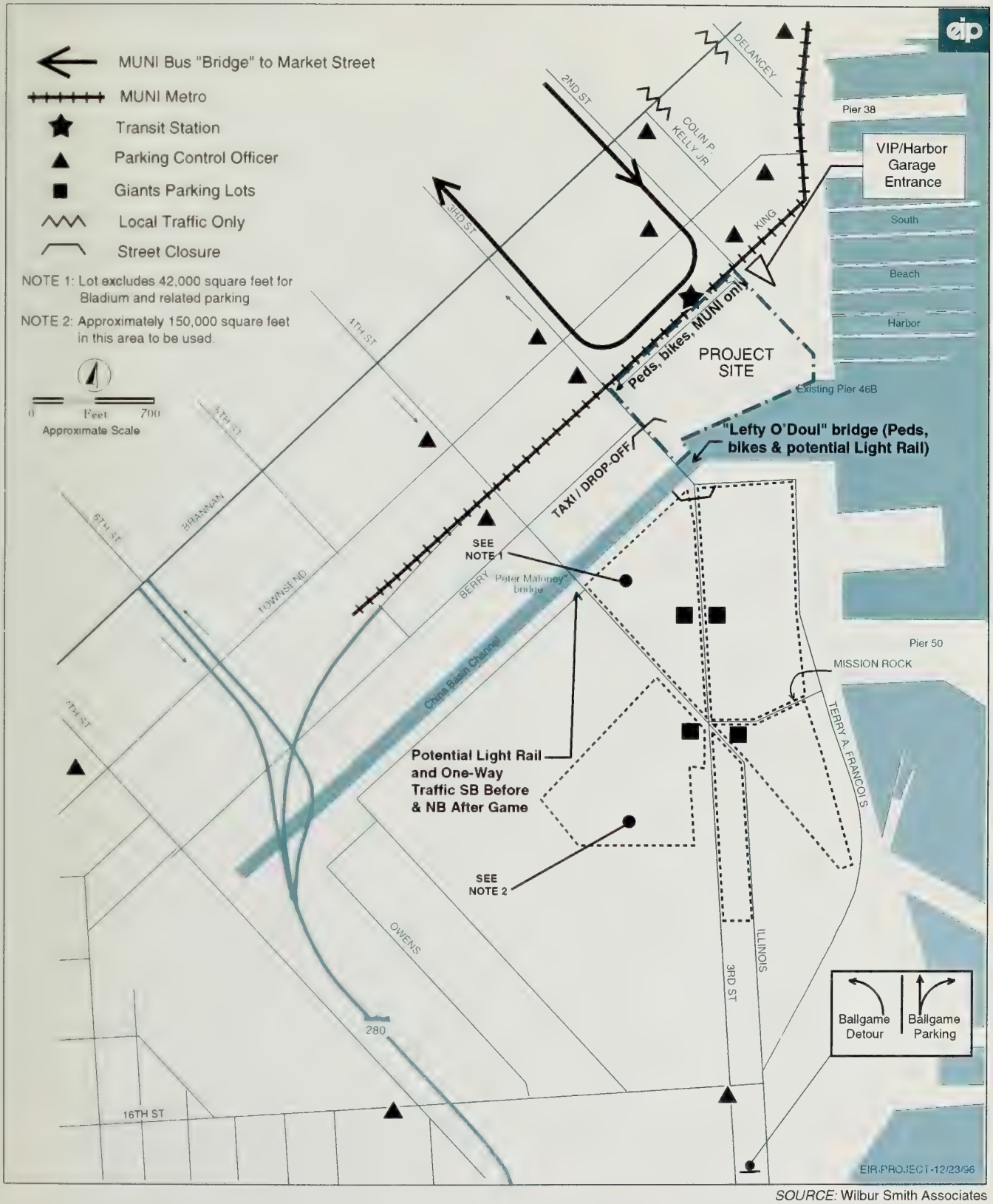
- Direct non-project traffic to alternate routes to allow project traffic and other local traffic to use the streets leading to the ballpark and ballpark parking.
- Discourage traffic intrusion into nearby residential neighborhood areas to the maximum extent feasible.
- Maintain a reasonable level of access to all properties in the project area.
- Provide motorists with traffic detour and alternate route information prior to arrival in the ballpark vicinity.
- Disperse ballpark traffic quickly after games to a variety of traffic routes.

- Flexibly accommodate traffic conditions as they change due to different types and sizes of events at different times of year, different days of the week, and different times of day.

- The routing would be accomplished through the use of signs, both permanent and temporary, personnel to control traffic (Parking Control Officers [PCOs]), and traffic cones and barriers. Figure V.B.1 shows some of the key features of the traffic routing mitigation measures.

While in some cases barriers should be used to close portions or sections of streets, many of the traffic routing controls should be passive in nature. For example, at some locations ballpark traffic would be advised by signs to take a particular route, while non-ballpark traffic would be advised to take another route. If a driver not traveling to the ballpark wished to use the route designated for ballpark traffic, the system would allow this. Most drivers would find, however, that such a choice would result in delays and out-of-direction travel. Partial barriers and signs should be used to discourage ballpark traffic from using certain streets which are residential in nature. Again, these measures would be passive and would not fully prevent a driver from entering the street if desired. At some critical locations, PCOs should be stationed to visually enforce the sign and barriers. The PCOs would advise a driver not to use the street, but they would not prevent any driver from entering a street. The exception to this would be the area around the Lefty O'Doul Bridge and King Street between Second and Third Streets which should be closed to all traffic except transit vehicles, including potential Third Street Light Rail (LRT), pedestrians, bicycles, and emergency vehicles, before and after ballgames.

The street closures and detours would cause inconvenience for those who live, work, or have other reasons to have to travel to areas adjacent to the ballpark. A certain amount of out-of-direction travel and delay due to the heavy flows of traffic would be inevitable. In addition, street closures could make deliveries to and shipping from businesses located across King Street from the ballpark inconvenient. The traffic routing plan should, however, maintain a reasonable level of access to all properties in the study area.



SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

● **Figure V.B.1 Recommended Traffic Routing Plan**

Specific Traffic Routing Measures

Implementation of a traffic routing plan would require assistance by PCOs, proper signing (i.e., detour signs) and street closure/conversion. In addition, motorists should be provided with traffic detour and alternate route information further in advance (e.g., on freeways) so that impacts near the project site could be minimized. Specific measures to be included in a traffic routing plan are as follows:

- Install signs on northbound U.S. 101 approaching I-280 to guide project traffic to use I-280.
- Install guide signs to designated project parking areas as needed.
- Install changeable message signs on northbound I-280 south of Cesar Chavez Street and in advance of the split between King Street and Sixth/Brannan Street ramps. Use messages that guide through traffic around the area and ballpark traffic to the nearest project parking area. Detour signs would also be posted, as necessary, on I-280 south of Mariposa Street to guide motorists to alternate ramps (e.g., Cesar Chavez or Sixth Street).
- Post parking attendants on Third Street north of Fourth Street and on Fourth Street near Third, before a game, to form an entrance to the designated ballpark parking area.
- Implement controls to limit the use of Third Street between King and Sixteenth Streets by non-ballpark traffic, including these or similar measures:
    - For the hour before and after games at the ballpark, place barriers across Third Street 100 feet (ft.) south of the south end of the Lefty O'Doul Bridge and on the south side of the intersection of Third/Berry Streets to block vehicle access to the bridge.
    - Prior to closure, place **Recommended Detour** signs along the Cesar Chavez, Potrero Avenue and Seventh Street alternate routes.
    - Once these are in place, use PCOs at the intersections of Third/Sixteenth Streets, King/Second Streets, and King/Fourth Streets to enforce the mandatory detour around the Lefty O'Doul Bridge. About 10 PCOs would be required at these intersections and to control pedestrian flows near the ballpark. Place a temporary **Local Traffic Only** sign on Sixth Street at the Sixteenth Street intersection to discourage attempts to use Sixth Street as a bypass around the Third Street detour.
    - Reserve a lane for transit vehicles only on Third Street, and use traffic cones to keep pedestrians out of the transit lane. MUNI's plan to extend light rail service

along the Third Street corridor is compatible with the recommended ballpark traffic plan to exclude auto and truck traffic for one hour prior to and after ballgames. MUNI is considering both a one-way routing—northbound crossing the Lefty O'Doul Bridge on Third Street and southbound crossing the Peter Maloney Bridge on Fourth Street—and a two-way routing using Fourth Street. Pedestrian travel on the Lefty O'Doul Bridge could be accommodated with MUNI light-rail service using either one or two lanes on the bridge if all other vehicular traffic is detoured.

- Once the mandatory detour at Sixteenth Street and Third Street is in operation and the barriers south of the bridge are in place, parking attendant lanes could be established and parking for the ballgame may begin.

Following the game, the barriers would need to be kept in place until pedestrian and bus transit/light rail movements have substantially cleared from the periphery of the ballpark and on the Lefty O'Doul Bridge. This is estimated to occur one hour after the game ends.

- Control and route traffic so that the land uses on Berry Street between Third and Fourth Streets have access to the portion of Third Street between Berry and King Street at all times. These uses are the China Basin Landing Building and the future uses planned for the Mission Bay project north of Berry Street. PCOs would need to control traffic on this short section of Third Street. On eastbound King Street at Third Street, traffic destined for these land uses should be allowed to turn right in order to reach Berry Street. Traffic exiting these uses from Berry Street would turn left onto northbound Third Street and be allowed by the PCOs through the Third and King Street intersection.

- Provide truck access to businesses on the north side of King Street between Second and Third Streets as needed during pre- and post-game closures. PCOs would need to allow deliveries on this segment of King Street, making sure that trucks did not interfere with bus bridge and MMX loading and unloading before and after ballgames.

- Work with the Coast Guard and involve property owners and tenants with boats docked in China Basin Channel to develop a set of procedures that would minimize the Peter Maloney Bridge and Lefty O'Doul Bridge openings for about 45 minutes to an hour before and after a game.

- Work with property owners and tenants (e.g., Mission Bay Golf Center) along Channel Street, Owens Street, and China Basin Street between Fourth Street and Sixteenth Street to manage ballpark traffic between the Giants ballpark parking lots and Sixteenth Street. For example, PCOs and barriers may be needed across Owens Street near Sixteenth Street and Channel Street at the west end of the Giants' parking area west of Fourth Street to restrict ballpark traffic from using Channel and Owens Streets if necessary.

- Route private game-oriented charter buses to a passenger loading and bus staging area proposed on the east side of Third Street at the intersection with Fourth and Mission Rock Streets. Charter buses would be directed to approach this location from Fourth Street from the north and Third Street from the south. Ingress to the staging area could be provided from Third Street with egress onto Mission Rock Street. Passengers would walk to and from the ballpark along Third Street, which would be closed to traffic. The PCOs located at intersections along the Third and Fourth Street routes would be instructed to give priority to MUNI vehicles and charter buses to the extent that is practical. A priority access/egress route for charter buses, such as that now provided at 3Com Park, would not be available. This lack of priority may inhibit charter bus operations as compared with the current level of usage at 3Com Park.

- Install a permanent guide sign on northbound U.S. 101 approaching the Vermont Street off-ramp as follows: **Giants Ballpark Traffic Use Seventh Street Exit**.

- Install a permanent guide sign on the northeast corner of Vermont and Mariposa Streets directed toward off-ramp traffic with a directional arrow toward northbound Vermont Street as follows: **Giants Ballpark Traffic Use Vermont Street**.

- Install a permanent guide sign on the southeast corner of the intersection of Vermont and Sixteenth Streets with a directional arrow toward eastbound Sixteenth Street to access dedicated Giants parking south of China Basin Channel as follows: **Giants Ballpark Traffic Use Sixteenth Street →** with a directional arrow toward eastbound Sixteenth Street for access to dedicated Giants parking south of China Basin Channel. Alternatively, traffic could continue north on Vermont Street to access private parking facilities north of China Basin Channel.

- Place barriers and PCOs at King/Third and King/Second Streets restricting access to King Street. Between Second and Third Streets, the south side of King Street would be restricted to pedestrians and bicycles while the north side (westbound direction) would be available for MUNI shuttle buses traveling south from Market Street on Second Street, loading/unloading passengers along the north side of King Street and returning to Market Street via Third Street.

- Place barriers, chains and a **No Ballpark Traffic** sign at the east side of Brannan/ Second Streets, west side of South Park Avenue/Second Street and the east side of South Park Avenue/Third Street to restrict through traffic in residential areas. These measures would be instituted only if actual monitoring of traffic conditions determines the need to discourage through traffic in these areas.

Preliminary Traffic Routing Plan

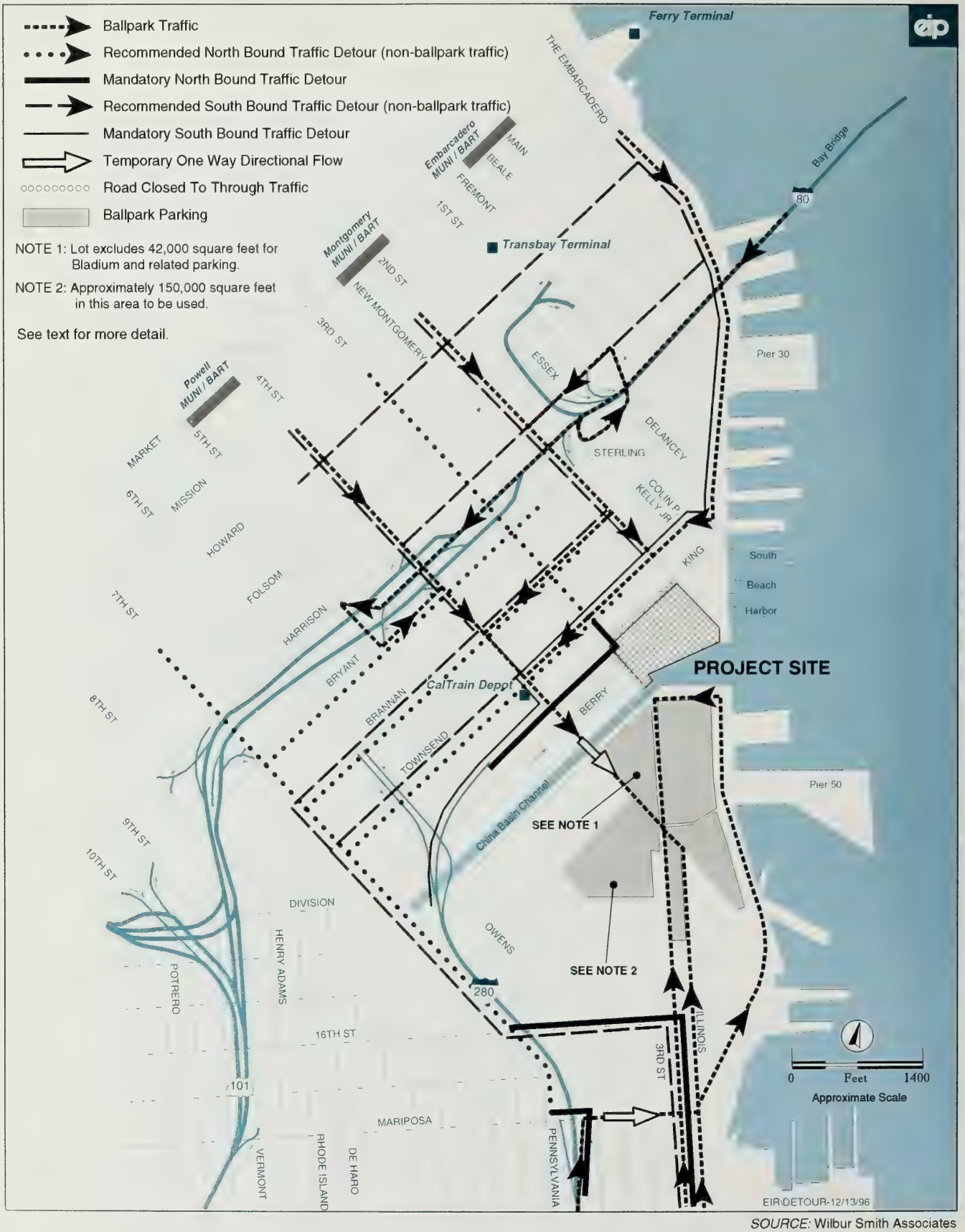
The preliminary traffic routing plan described below presents an example of an overall program to reduce congestion around the ballpark and dedicated ballpark parking lots. The group of measures analyzed here is not expected to be the only approach to accomplishing the goal of reducing traffic congestion and further improving transit access to the new ballpark. The Ballpark Transportation Coordinating Committee would be expected to establish a traffic routing plan program that includes the flexibility to adjust for changes in circumstances and the ability to modify the program as more effective approaches emerge. For example, the locations of traffic signs, barriers and persons directing traffic may need to be adjusted over time to accommodate new situations or to improve the operations based on then-existing conditions in the area. Therefore, the analysis below should be understood to be an analysis of a typical, representative traffic routing plan.

The detailed preliminary traffic routing plan for "pre-game" and "post-game" conditions for both project and non-project traffic is discussed in the next sections.

Pre-Game Project Traffic Routing Plan

The pre-game preliminary traffic routing plan is illustrated in Figure V.B.2. All project traffic originating from the north and west sides of the ballpark would arrive at the dedicated ballpark parking lots south of the channel via Fourth Street because the Lefty O'Doul Bridge and Third Street south of King Street would be closed. Fourth Street between Townsend and Third Streets would be converted to one-way southbound during the hour before games.

In order to distribute detoured traffic more evenly, "Recommended Detour" signs would be placed well in advance at upstream intersections along The Embarcadero and Second Street (e.g., at Howard and Harrison Streets) to encourage motorists to take alternate routes.



SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure V.B.2 Pre-Game Traffic Detour

Project traffic from the south would most likely come from I-280 and Third Street. The section of Mariposa Street between the I-280 off-ramp and Third Street would be converted to one-way eastbound before games. Ballpark traffic could then arrive at the parking lots via Third Street, Illinois Street, or Terry A. Francois Boulevard. PCOs would monitor the traffic detour at key locations (e.g., I-280 off-ramp, Third/Mariposa Street). Traffic destined for the Downtown or other areas north of the Channel would be encouraged to stay on I-280 and exit at Sixth and Brannan Streets or would be diverted to Seventh Street at Sixteenth Street. This would be done with a system of permanent and changeable message signs, as well as some portable temporary signs. The changeable message signs and the temporary signs would alert the motorist that a ballpark event is occurring and provide routing information. The permanent signs would define the standard ballgame detour routes. For example, on northbound I-280 a sign could advise motorists: "During Ballgames - Continue to 6th Street."

Post-Game Project Traffic Routing Plan

Project traffic departing the parking lots destined northbound (e.g., I-80/Bay Bridge) would be directed to use Fourth Street because the Lefty O'Doul Bridge would be closed to general vehicular traffic. The section of Fourth Street between Third and King Streets would be converted to one-way northbound after games. Project traffic would turn right and head east on King Street to Third Street, turn left onto Third Street or turn right from Fourth Street onto Townsend Street, and then turn left at Third or Second Streets. There would be PCOs at these intersections to monitor traffic. The post-game preliminary traffic routing plan is shown in Figure V.B.3.

Southbound project traffic destined for I-280 and Third Street would be directed to travel south on Third Street, Illinois Street, or Terry Francois Boulevard (depending on the parking lot location) and access the freeway via the Mariposa ramps. The section of Mariposa Street

SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure V.B.3 Post-Game Traffic Detour

between Third Street and the Mariposa on-ramp would be converted to one-way westbound during the hour after ballgames. PCOs would be at key locations (e.g., Third/Mariposa, I-280 off-ramp) to monitor traffic.

Under both pre-game and post-game routing plans, King Street between Second and Third Streets, Third Street between King Street and the Lefty O'Doul Bridge, and the bridge would be closed to vehicular traffic before and after games. There would be "Mandatory Detour" signs at these intersections as well as on Townsend Street to monitor traffic and ensure the detour is implemented effectively. A mandatory detour would involve signs and barriers forcing all traffic to use the detour route. In some cases, PCOs would have the ability to allow certain types of traffic past the Mandatory Detour barrier. For example, transit vehicles, including the proposed Third Street LRT, would be allowed to use the closed section of King Street, Third Street and the Lefty O'Doul Bridge, and vehicles destined for the China Basin Building on Berry would be permitted to use Third Street south of King Street.

Non-Project Traffic Routing - Before/After Ballgames

While there would be differences in detouring pre-game and post-game project traffic, non-project traffic would be detoured similarly under both conditions.

Non-project traffic traveling on Third and Fourth Streets south of the project site would be detoured before and after games. Northbound traffic on Third Street would be required to turn left on Sixteenth Street, continue west and then turn right on Seventh Street. Depending on their destinations, motorists could choose to return to their original routes (e.g., Third Street, The Embarcadero) via any eastbound corridor such as Folsom Street.

Non-project traffic traveling southbound on The Embarcadero would be detoured to Townsend Street, and traffic on Second Street and Fourth Street would be detoured to Brannan and Townsend Streets. Between The Embarcadero and Second Street, through traffic on Brannan Street could be discouraged by "Local Traffic Only" signs, if results of monitoring traffic conditions with this section of the street open indicate a need for the signs. In order to further relieve traffic near the project vicinity, "Recommended Detour" signs would also be positioned at upstream intersections to encourage motorists to use alternate routes such as Howard and Harrison Streets.

Motorists north of the China Basin Channel destined for I-280 could either travel southbound on Fourth Street then turn right to the King Street ramp or access the Sixth Street ramp via Brannan Street or Sixth Street. PCOs and detour signs would be used at locations where special traffic operations are required. Under both pre-game and post-game traffic routing plans, there would be minimal impacts on access to and from all major freeways (I-80, U.S. 101, and I-280). While there would be "Recommended Detour" signs on I-280 approaching Downtown to encourage motorists to use the Sixth Street exit, the King Street off-ramp would still remain open at all time periods. However, during the post-game hour, traffic exiting via the King Street off-ramp would then be detoured to Fourth Street and continue eastbound on Townsend Street.

Impacts of Traffic Routing Plan

This section discusses the impacts of the traffic routing mitigation measure and the specific measures included in the preliminary traffic routing plan at intersections and on the arterials in the project study area to reduce these impacts.

Analysis of Preliminary Traffic Routing Plan

While traffic impacts on study intersections have been analyzed as presented in the impacts section (see IV.E. Transportation and Circulation, pp. IV.75 - IV.236), the preliminary traffic routing plan could result in impacts different from those previously discussed. For example, under the preliminary traffic routing plan, there would not be any non-project traffic at intersections such as Third/Fourth Streets and King/Second Streets, whereas traffic volumes would increase at other intersections such as Townsend/Fourth Streets.

The analysis of the impacts of the traffic routing mitigation measures also reflects traffic reductions due to the added ferry and CalTrain services described above. These reductions primarily impact the regional freeway network and the freeway ramp system. If for some reason the added services were not provided, conditions on U.S. 101 and I-280 south of the ballpark would worsen. The most substantial change in conditions would be after a weekday night game; however, the impact would not be enough to degrade freeway service levels on either of these routes to a level of service E or F during this time period. Similarly, if the proposed ferry service were not provided, conditions on the Bay Bridge, the Golden Gate Bridge, U.S. 101 and I-280 would worsen compared to conditions with ferry service, but the extent of the change in conditions would not be substantial. If more baseball fans used ferries and CalTrain service than is estimated in this analysis, freeway traffic would improve somewhat.

- The preliminary traffic routing plan calls for use of Terry A. Francois Boulevard as additional access to dedicated ballpark parking lots. This use would add traffic to this local street and could inconvenience and delay users of the boat launch ramp at Pier 52 and the restaurants, picnic area and fishing areas along this part of the waterfront.

Table V.B.1 shows the intersection levels of service for both existing (redistributed)-plus-project traffic conditions and existing-plus-project under preliminary traffic routing plan conditions. Two intersections were added to the analysis—Seventh and Townsend Streets and Seventh and Brannan Streets—to account for through traffic detoured to Seventh Street before and after ballgames, increasing the total number of intersections analyzed to 68.

TABLE V.B.1 •
EXISTING PLUS PROJECT INTERSECTION LEVELS OF SERVICE WITH DETOURS[1]

Study Intersections	Existing Redistributed + Project				Existing Redistributed + Project Traffic (Detoured)			
	Weekday[2] Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend 4:00-5:00 PM	Weekday[2] Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Berry Street at:								
▸ Third Street	D	A	N/A	N/A	A	A	N/A	N/A
King Street at:								
▸ Fourth Street	C	F	B	C	F	F	F	F
▸ Third Street	F	B	B	F	A	A	A	A
▸ Second Street	F	C	C	C	D	C	A	A
Townsend Street at:								
▸ Eighth/ Henry Adams/Division	A	A	A	A	A	A	B	B
▸ Seventh Street[3]	B	B	N/A	N/A	F	F	N/A	N/A
▸ Fourth Street	B	F	B	B	F	F	F	F
▸ Third Street	F	D	F	F	F	F	F	F
▸ Second Street	B	B	B	B	D	D	B	B
▸ The Embarcadero	B	B	B	B	F	F	F	F

Notes:

1. "Detours" means traffic rerouting and other features of the preliminary traffic routing plan discussed in the accompanying text.
2. Limited to thirteen games per year.
3. Additional intersection analyzed under traffic routing plan.

N/A = Intersection not analyzed during this time period.

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Brannan Street at:								
▸ Seventh Street[3]	B	B	N/A	N/A	F	C	N/A	N/A
▸ Sixth Street/ I-280 Ramps	C	B	B	B	F	C	B	C
▸ Fifth Street	C	B	B	B	D	B	B	B
▸ Fourth Street	B	F	B	B	F	F	B	B
▸ Third Street	F	B	D	F	F	C	B	C
▸ Second Street	B	B	B	B	E	B	B	B
▸ The Embarcadero	D	B	B	B	C	B	B	B
Bryant Street at:								
▸ Seventh Street	B	B	N/A	N/A	B	B	N/A	N/A
▸ Sixth Street	D	F	B	B	F	F	B	B
▸ Fifth Street	F	F	B	D	F	F	C	F
▸ Fourth Street	B	F	B	B	B	F	B	B
▸ Third Street	F	B	F	F	F	B	F	F

Notes:

1. "Detours" means traffic rerouting and other features of the preliminary traffic routing plan discussed in the accompanying text.
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▸ Second Street	F	D	B	B	F	C	B	B
▸ Main Street	C	B	N/A	N/A	D	B	N/A	N/A
▸ The Embarcadero	D	B	C	C	D	B	C	C
Harrison Street at:								
▸ Seventh Street	B	B	B	B	B	B	B	B
▸ Sixth Street	E	B	B	B	F	C	B	B
▸ Fifth Street	C	E	B	B	F	E	B	E
▸ Fourth Street	F	F	F	F	F	F	E	E
▸ Third Street	F	D	B	F	D	B	B	B
▸ Second Street	F	F	N/A	N/A	F	F	N/A	N/A
▸ Essex Street at I-80 on-ramp	F	F	B	B	F	E	B	B
▸ First Street	F	F	B	B	F	F	B	B
▸ Fremont Street	F	F	N/A	N/A	F	F	N/A	N/A
▸ Main Street	F	B	C	B	F	B	C	B
▸ The Embarcadero	F	B	B	C	B	B	B	B

Notes:

1. "Detours" means traffic rerouting and other features of the preliminary traffic routing plan discussed in the accompanying text.
2. Limited to thirteen games per year.
3. Additional intersection analyzed under traffic routing plan.

N/A = Intersection not analyzed during this time period.

TABLE V.B.1 •
EXISTING PLUS PROJECT INTERSECTION LEVELS OF SERVICE WITH DETOURS[1]

Study Intersections	Existing Redistributed + Project				Existing Redistributed + Project Traffic (Detoured)			
	Weekday[2] Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend 4:00-5:00 PM	Weekday[2] Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Folsom Street at:								
▸ Sixth Street	E[3]	F[3]	N/A	N/A	F	F	N/A	N/A
▸ Fourth Street	F	F	N/A	N/A	F	F	N/A	N/A
▸ Third Street	E	B	N/A	N/A	C	B	N/A	N/A
▸ Second Street	F	F	N/A	N/A	F	F	N/A	N/A
▸ First Street	D	F	N/A	N/A	D	F	N/A	N/A
▸ Fremont Street	B	B	N/A	N/A	B	B	N/A	N/A
▸ Main Street	B	B	N/A	N/A	B	B	N/A	N/A
▸ The Embarcadero	B	B	B	B	B	B	B	B
Howard Street at:								
▸ Sixth Street	F	C	N/A	N/A	F	C	N/A	N/A
▸ Fourth Street	F	E	N/A	N/A	F	E	N/A	N/A
▸ Third Street	D	B	N/A	N/A	B	B	N/A	N/A

Notes:

1. "Detours" means traffic rerouting and other features of the preliminary traffic routing plan discussed in the accompanying text.
2. Limited to thirteen games per year.
3. Additional intersection analyzed under traffic routing plan.

N/A = Intersection not analyzed during this time period.

TABLE V.B.1 •
EXISTING PLUS PROJECT INTERSECTION LEVELS OF SERVICE WITH DETOURS[1]

Study Intersections	Existing Redistributed + Project				Existing Redistributed + Project Traffic (Detoured)			
	Weekday[2] Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM	Weekday[2] Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Sixteenth Street at:								
▸ Potrero Avenue	C	B	B	B	C	B	B	B
▸ Vermont Street	B	A	N/A	N/A	B	A	N/A	N/A
▸ Rhode Island Street	B	B	N/A	N/A	B	B	N/A	N/A
▸ Mississippi/7th/ Pennsylvania	C	A	N/A	N/A	F	F	N/A	N/A
▸ Third Street	F	B	C	E	F	F	B	F
▸ Illinois Street	F	B	N/A	N/A	B	B	N/A	N/A
Mariposa Street at:								
▸ Vermont Street	B	B	N/A	N/A	B	B	N/A	N/A
▸ DeHaro Street	A	A	N/A	N/A	A	A	N/A	N/A
▸ Pennsylvania/ I-280 on-ramp	C	B	A	A	C	B	A	A
▸ I-280 off-ramp	B	B	B	B	C	B	B	B
▸ Third Street	F	F	F	F	F	F	F	F
▸ Illinois Street	C	F	B	B	D	E	D	D

Notes:

1. "Detours" means traffic rerouting and other features of the preliminary traffic routing plan discussed in the accompanying text.
2. Limited to thirteen games per year.
3. Additional intersection analyzed under traffic routing plan.

N/A = Intersection not analyzed during this time period.

TABLE V.B.1 •
EXISTING PLUS PROJECT INTERSECTION LEVELS OF SERVICE WITH DETOURS[1]

Study Intersections	Existing Redistributed + Project				Existing Redistributed + Project Traffic (Detoured)			
	Weekday[2] Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend 4:00-5:00 PM	Weekday[2] Afternoon 3:30-4:30 PM	Weekday Night 6:30-7:30 PM	Weekday Night 10:30-11:30 PM	Weekend Day 4:00-5:00 PM
Potrero Avenue at:								
▸ Tenth/Brannan/Division	B	B	B	C	B	B	B	C
Third/Fourth Streets	F	F	F	F	F	F	F	F
Market Street at:								
▸ Fourth/Stockton/Ellis	B	B	B	B	B	B	B	B
▸ Third/Kearny/Geary	B	B	B	B	B	B	B	B
Third/Cesar Chavez (Army) Sts.	D	B	B	B	D	B	B	B
Third/Jamestown Streets	A	B	B	B	A	B	B	B
Mission Street at:								
▸ 4th Street	B	B	N/A	N/A	B	B	N/A	N/A
▸ 3rd Street	B	B	N/A	N/A	B	B	N/A	N/A
Embarcadero/Broadway	E	F	C	D	E	F	C	C

Notes:

1. "Detours" means traffic rerouting and other features of the preliminary traffic routing plan discussed in the accompanying text.
2. Limited to thirteen games per year.
3. Additional intersection analyzed under traffic routing plan.

N/A = Intersection not analyzed during this time period.

These two intersections were not included in the weekday 10:30 - 11:30 p.m. and Saturday (4:00 - 5:00 p.m.) scenarios because field observations showed that traffic volumes during these time periods are low and project traffic would have minor impacts on these intersections.

During the weekday 3:30 - 4:30 p.m. post-game period, the level of service for 11 of the 68 intersections would decline from LOS D or better to LOS E and F, and two intersections would decline from LOS E to LOS F. About six intersections would improve to level of service D or better from level of service E or F. During the weekday evening 6:30 - 7:30 p.m. pre-game period, the level of service would deteriorate from LOS D or above to LOS E and F at five intersections and none would improve from level of service E or F to LOS D or better. During the weeknight 10:30 - 11:30 p.m. post-game hour, three intersections would experience a significant impact in levels of service and none would improve to level of service D or better. During the Saturday 4:00 - 5:00 p.m. post-game hour, the level of service for five intersections would decline from LOS D or better to LOS E and F, and three intersections would improve to LOS D or better from LOS E or F.

Overall, the detours and traffic rerouting tend to result in a net increase in the number of intersections at LOS E or F. This is because the preliminary plan tends to disperse traffic over a larger number of locations, preventing severe gridlock type conditions at intersections near the ballpark. A second key factor is that the above analysis depicts the impact of the detour routes without any additional measures to accommodate the traffic that is diverted to the new routes. Improvement measures are recommended at intersections where there would be a significant impact under the preliminary traffic routing plan. Specific traffic measures at each intersection in the preliminary plan are discussed in detail in Table V.B.2.

The noise and air quality effects of the preliminary traffic routing plan, including detours and other measures included in the specific traffic routing mitigation measures, have been analyzed and described in IV.F. Noise, pp. IV.245 - IV.251, and IV.G. Air Quality, pp. 277 - 278.

TABLE V.B.2 •
SUMMARY OF INTERSECTION IMPROVEMENTS

Intersection	Impact	Temporary Improvements One Hour Before/After Game	Permanent Improvements
King/Fourth	3:30-4:30 PM: LOS F to LOS B 6:30-7:30 PM: LOS F to LOS C 10:30-11:30 PM: LOS F to LOS C Saturday: LOS F to LOS C	Parking Control Officer (PCO) to monitor traffic. Pre-game: With traffic detour, Fourth St. north of King Street becomes one-way southbound to provide four travel lanes approaching the project parking lots. Post-game: With traffic detour, Fourth Street becomes one-way northbound and has four lanes which include two through lanes, one shared right-through lane, and one right-turn lane; Third Street LRT would continue to be southbound. Left-turns prohibited for eastbound traffic.	
King/Third	Operate at LOS D or better at all time periods on game days (under detour plan).	Parking Control Officer to enforce detour and monitor traffic. Northbound Third St. approach used only by China Basin Building traffic, transit and taxicabs. Eastbound King St. open only to left-turn traffic. Pedestrians would be directed to cross Third Street on the south side of the intersection and cross King Street on the east side of the intersection.	Improve sidewalks.
King/Second	Operate at LOS D or better at all time periods on game days (under detour plan).	Parking Control Officer to monitor traffic and enforce detour before/after games. No vehicular traffic on eastbound King St. approach (detoured). Westbound King St. west of intersection open to buses only. Westbound left-turn used by VIPs destined for Project parking garage and others performing U-turn.	Construct sidewalks along both sides of Second St. and the north side of King St.
Townsend/Seventh	3:30-4:30 PM: LOS F to LOS E 6:30-7:30 PM: LOS F to LOS D	Parking Control Officer to monitor traffic. Pre-game: Department of Parking and Traffic (DPT) to provide a pre-event signal timing plan to allocate more green time to northbound/southbound approaches. Post-game (3:30-4:30 PM): Temporarily convert one southbound lane to northbound and provide dual right-turn lanes for westbound approach.	Restripe the westbound approach to show one shared left-through lane and a right-turn lane.

TABLE V.B.2 •
SUMMARY OF INTERSECTION IMPROVEMENTS

Intersection	Impact	Temporary Improvements One Hour Before/After Game	Permanent Improvements
Townsend/Fourth	3:30-4:30 PM: LOS F to LOS D 6:30-7:30 PM: LOS F to LOS C 10:30-11:30 PM: LOS F to LOS B Saturday: LOS F to LOS D	Parking Control Officer to monitor traffic. Pre-game: Fourth St. becomes one-way southbound. PCOs and signs direct traffic to follow detour plan. Post-game: Fourth St. becomes two-way between Townsend and King St., with one lane southbound and three lanes northbound (1 left/2 right). East/westbound approaches remain unchanged.	
Townsend/Third	3:30-4:30 PM: LOS F to LOS D 6:30-7:30 PM: LOS F to LOS D 10:30-11:30: LOS F to LOS D Saturday: LOS F to LOS D	Parking Control Officer to monitor traffic and enforce detour. Pre-game: Rightmost lane on Third St.(NB) becomes exclusive right-turn lane and Lane 2 becomes shared right-through lane (implemented with help of PCO and signs). Post-game: Temporarily convert one westbound lane to provide an exclusive eastbound left-turn lane. Prohibit parking on Third St. (3:30-4:30 PM) to provide an additional through lane.	
Townsend/ The Embarcadero	3:30-4:30 PM: LOS F to LOS C 6:30-7:30 PM: LOS F to LOS D 10:30-11:30: LOS F to LOS B Saturday: LOS F-to LOS C	Pre-game/Post-game (All scenarios): Parking Control Officer to monitor traffic and enforce detour. Position detour signs to guide traffic.	
Brannan/Seventh	3:30-4:30 PM: LOS F to LOS E	Post-game (Weekday Day Game only): Parking Control Officer to monitor traffic and enforce detour. Prohibit parking on both sides of Seventh Street south of Brannan Street to provide two through lanes and an exclusive right turn lane in the northbound approach.	
Brannan/Sixth/ I-280 Off-Ramps	3:30-4:30 PM: LOS F to LOS C	Post-game (Weekday Day Game only): DPT to provide a post-event signal timing plan to allocate more green time to the eastbound approach.	
Brannan/Fourth	3:30-4:30 PM: LOS F to LOS C 6:30-7:30 PM: LOS F to LOS D	Pre-game: DPT to provide a pre-event signal timing plan to allocate more green time to the southbound approach. Post-game (Weekday Day Game only): DPT to provide a post-event signal timing plan.	

TABLE V.B.2 •
SUMMARY OF INTERSECTION IMPROVEMENTS

Intersection	Impact	Temporary Improvements One Hour Before/After Game	Permanent Improvements
Brannan/Third	3:30-4:30 PM: LOS F to LOS B	Post-game (Weekday Day Game only): Eliminate parking on Third Street to provide five lanes for northbound traffic. DPT to provide a post-event signal timing plan to allow more green time to the northbound approach.	
Brannan/Second	3:30-4:30 PM: LOS E to LOS B	Post-game (Weekday Day Game only): DPT to provide a post-event signal timing plan to allocate green time more effectively.	
Bryant/Sixth	3:30-4:30 PM: LOS F to LOS D 6:30-7:30 PM: LOS F to LOS D	Pre-game: DPT to re-evaluate and optimize signal timing. Post-game (Weekday Day Game only): Eliminate parking on southbound Sixth Street to provide three travel lanes. DPT to provide a post-game signal timing plan to allocate more green time to southbound traffic.	DPT to consider modifying existing signal timing plan.
Bryant/Fifth	6:30-7:30 PM: LOS F to LOS C Saturday: LOS F to LOS B	Pre-game: DPT to provide a pre-event signal timing plan to allocate more green time to southbound traffic. Post-game: DPT to provide a post-event signal timing plan to allow more green time to the northbound approach.	
Bryant/Fourth	6:30-7:30 PM: LOS F to LOS D	Pre-game: Parking Control Officer to enforce special lane assignment so that there would be one exclusive right-turn lane and a shared right-through lane in the eastbound approach. DPT to provide a pre-event signal timing plan to allocate more green time to eastbound traffic.	
Bryant/Third	3:30-4:30 PM: LOS F to LOS D 10:30-11:30 PM: LOS F to LOS B Saturday: LOS F to LOS C	Post-game (All scenarios): Parking Control Officer to enforce special lane assignment in the northbound approach so that there would be two through lanes, one shared right-through lane, and an exclusive right-turn lane. DPT to provide a special post-event timing plan to allocate more green time to northbound traffic.	DPT to consider re-striping the northbound approach and developing a permanent signal timing plan.
Bryant/Second	3:30-4:30 PM: LOS F to LOS D	Post-game (Weekday Day Game only): DPT to provide a special post-game signal timing plan to accommodate ballpark traffic (both north and eastbound) more effectively.	

TABLE V.B.2 •
SUMMARY OF INTERSECTION IMPROVEMENTS

Intersection	Impact	Temporary Improvements One Hour Before/After Game	Permanent Improvements
Harrison/Sixth	3:30-4:30 PM: LOS F to LOS C	Post-game (Weekday Day Game only): DPT to provide a special post-game signal timing plan to allocate green time more effectively.	DPT to consider changing the signal timing plan for PM peak hour.
Harrison/Fifth	3:30-4:30 PM: LOS F to LOS C 6:30-7:30 PM: LOS E to LOS C Saturday: LOS E to LOS C	Pre-game/Post-game: DPT to provide a special post-game signal timing plan to allocate green time more effectively.	DPT to consider changing the signal timing plan for PM peak hour.
Harrison/Fourth	10:30-11:30 PM: LOS E to LOS B Saturday: LOS E to LOS B	Pre-game: DPT to provide a pre-game timing plan to allow more green time to southbound traffic. Post-game (All scenarios): DPT to provide a special post-game timing plan to allocate more green time to the westbound approach.	DPT to consider prohibiting parking on the east side of Fourth Street during PM peak hour to allow one additional through lane.
Harrison/Second	6:30-7:30 PM: LOS F to LOS D	Pre-game: DPT to provide a pre-game timing plan to allow more green time to southbound traffic.	
Harrison/Fremont	3:30-4:30 PM: LOS F to LOS D 6:30-7:30 PM: LOS F to LOS C	Pre-game/Post-game (All scenarios): Parking Control Officer to monitor traffic. *(This is already being implemented during PM peak hour and should begin at 3:30 PM on game days.)*	Restripe northbound (off-ramp) approach to provide one left-turn lane, one through, and one shared right-through lane. With the new off-ramp at Folsom/Fremont, DPT would need to re-time this signal as traffic volume might change.
Harrison/Main	3:30-4:30 PM: LOS F to LOS D	Post-game (All Scenarios): DPT to provide a post-game timing plan to allocate more green time to the westbound approach. Prohibit parking in the northbound approach to make room for one additional through lane so that overall delay could decrease.	DPT to consider converting 90-degree parking to parallel parking on the east side of Main Street south of the intersection.

TABLE V.B.2 •
SUMMARY OF INTERSECTION IMPROVEMENTS

Intersection	Impact	Temporary Improvements One Hour Before/After Game	Permanent Improvements
Folsom/Sixth	3:30-4:30 PM: LOS F to LOS D 6:30-7:30 PM: LOS F to LOS D	Pre-game/Post-game (All scenarios): On game day, enforce parking prohibition on Sixth Street from 3:30 to 7:30 PM. This would allow three travel lanes in each direction. DPT to provide a special pre-/post-game timing plan to allow more efficient use of green time.	DPT to evaluate the existing signal timing plan at the intersection to ensure optimized use of capacity.
Folsom/Fourth	6:30-7:30 PM: LOS F to LOS D	Pre-game: Parking Control Officer to enforce special lane assignment in the eastbound approach to provide one exclusive right-turn lane, a shared through-right lane, and two through lanes. This would provide more capacity to the right turn movement for ballpark traffic. DPT also to provide special pre-game timing plan to allow more green time to eastbound traffic.	
Folsom/Second	6:30-7:30 PM: LOS F to LOS C	Pre-game: DPT to provide a pre-game signal timing plan to allocate more green time to the southbound approach.	DPT to evaluate existing signal timing and perhaps modify signal phasing.
Howard/Sixth	3:30-4:30 PM: LOS F to LOS C	Post-game (Weekday Day Game only): DPT to provide a post-game timing plan to optimize green time allocation.	DPT to consider re-timing the signal.
Howard/Fourth	3:30-4:30 PM: LOS F to LOS B 6:30-7:30 PM: LOS E to LOS D	Pre-game: DPT to provide a special pre-game signal timing plan to allow more green time to southbound traffic. Post-game (Weekday Day Game only): DPT to provide a post-game timing plan to optimize green time allocation.	DPT to consider re-timing the signal for PM peak hour.
Sixteenth/Mississippi/ Seventh	3:30-4:30 PM: LOS F to LOS D 6:30-7:30 PM: LOS F to LOS A	Pre-game/Post-game (All scenarios): Parking Control Officer to monitor traffic and enforce detour.	DPT to consider installing a traffic signal when traffic volumes increase in the future.
Sixteenth/Third	3:30-4:30 PM: LOS F to LOS E 6:30-7:30 PM: LOS F to LOS D Saturday: LOS F to LOS C	Pre-game/Post-game (All scenarios): Parking Control Officer to monitor traffic and enforce detour. Assign two northbound lanes for left-turn traffic.	

TABLE V.B.2 •
SUMMARY OF INTERSECTION IMPROVEMENTS

Intersection	Impact	Temporary Improvements One Hour Before/After Game	Permanent Improvements
Mariposa/Third	3:30-4:30 PM: LOS F to LOS D 6:30-7:30 PM: LOS F to LOS D 10:30-11:30 PM: LOS F to LOS B Saturday: LOS F to LOS B	Pre-game/Post-game (All scenarios): Position Parking Control Officer and detour signs to monitor traffic and enforce detour. All post-game times: assign one exclusive right-turn lane, one shared right-through lane, and a through lane to improve project traffic flow.	
Mariposa/Illinois	6:30-7:30 PM: LOS E to LOS A	Pre-game/Post-game (All scenarios): Parking Control Officer to monitor traffic.	Restripe Illinois Street.
Third/Fourth	3:30-4:30 PM: LOS F to LOS B 6:30-7:30 PM: LOS F to LOS B 10:30-11:30 PM: LOS F to LOS B Saturday: LOS F to LOS B	Pre-game/Post-game (All scenarios): Parking Control Officer to monitor traffic and enforce detour before/after games. Lefty O'Doul Bridge closed to vehicular traffic. Fourth St. becomes one-way southbound before games and northbound after games. Giants' to provide parking attendants to direct vehicles near parking lots.	Install directional signs for Giants' Parking Lots.
The Embarcadero/ Broadway	3:30-4:30 PM: LOS E to LOS C 6:30-7:30 PM: LOS F to LOS C	Pre-game/Post-game (Weekdays only): DPT to develop a pre- and post-game signal timing plan to accommodate increase in project traffic in the north and southbound directions.	DPT to evaluate existing signal timing plan for PM peak hour and if necessary, optimize timing.

Source: Wilbur Smith Associates.

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As shown in Table V.B.2, pp. V.26 - V.31, most of the recommended measures would be temporary improvements. This is due to the unique nature of this project. Unlike other typical developments, traffic generated by the project would likely follow some anticipated patterns, in terms of time (dictated by game times) and travel paths (controlled by special routing plans). Therefore, temporary measures would be more efficient and more flexible, especially because game attendance could vary substantially, requiring fewer mitigation measures for games with lower attendance. Project-specific improvement measures (permanent and temporary) to reduce impacts caused by the preliminary traffic routing plan, including detours, are summarized below.

Temporary Mitigation Measures, Preliminary Routing Plan

Temporary measures are designed to relieve traffic congestion as a result of a large increase in traffic in the project vicinity (usually within a narrow time frame). These measures would be particularly efficient at intersections near the project site. Table V.B.2, pp. V.26 - V.31, provides the details for each impacted intersection. Some common examples of these short-term mitigation measures include:

- Position PCOs at busy intersections to monitor traffic and ensure pedestrian safety. In essence, the PCO would play the role of a traffic signal, manually assigning the right-of-way to traffic from different approaches. This would ensure effective use of the intersection capacity and delay would be minimized. The implementation of the preliminary traffic routing plan on a game day would require approximately 15 to 20 PCOs. In addition as noted in "Specific Traffic Routing Measures" above, about 10 PCOs would be required to effect the closure of King Street and the closure of the Lefty O'Doul Bridge, and to control pedestrian flows immediately adjacent to the ballpark.

- Develop a special signal timing plan at intersections where a Parking Control Officer might not be necessary (e.g., intersections with very few pedestrians). Since all traffic signals in the City are pre-timed, the Department of Parking and Traffic could design an optimized signal timing plan to serve project traffic effectively before and after games. (Currently, some signalized intersections near 3Com Park already operate with a special timing plan before and after ballgames.) These pre/post-event signal timing

plans should be determined based upon actual traffic demand and operating characteristics of the intersection so that the intersection capacity can be optimized.

- Install traffic cones and temporary detour signs at intersections where a special lane arrangement would accommodate project traffic more effectively. Permanent restriping at these intersections is usually impractical because traffic patterns could be quite different on non-game days.

- Prohibit on-street parking at locations where traffic is heaviest after weekday afternoon games (3:30 to 4:30) to increase intersection capacity and minimize delay. As a result of the mitigation measures described in Table V.B.2, pp. V.26 - V.31, approximately 50 on-street parking spaces would be lost after weekday afternoon games, most located near the project site, such as Third Street from Townsend to Brannan Streets. The proposed mitigation measures would not impact on-street parking during the other study time periods.

Permanent Mitigation Measures, Preliminary Routing Plan

While most of the recommended mitigation measures for the preliminary traffic routing plan would be temporary, usually before and after games, the permanent improvement measures described in Table V.B.2 could potentially solve some traffic problems permanently, and aid ballpark traffic. These permanent improvement measures would provide two main advantages:

1. Some of the temporary improvements would no longer be needed with the permanent improvements. For example, some intersections would not need a special-event signal timing plan if the existing timing plan was adjusted (optimized) permanently. In fact, it is unnecessary to implement a special event timing plan for intersections that are far from the ballpark, as traffic would become more dispersed and more difficult to predict.

2. As shown in Table IV.E.25, pp. IV.145-IV.149, some of the study intersections would already operate at unacceptable levels of service, especially during the weekday 3:30 - 4:30 p.m. period, with or without a ballpark. These recommended permanent improvements (e.g. re-striping a particular intersection approach) could solve some of the existing problems and possibly reduce the extent of temporary improvements necessary to mitigate ballpark traffic in the future.

While the recommended permanent improvements described in Table V.B.2 were devised specifically for intersections, other general permanent measures should also be considered and some are listed below.

It is important to note that none of these measures are part of the present programmed capital improvement plans of the City and County of San Francisco or any other public agency. As a result, there is no designated source of funds for these mitigation measures, and the source would need to be identified as part of the project review and approval process.

- The Department of Parking and Traffic (DPT) should re-evaluate traffic signal timing at intersections at which an unacceptable level of service was identified, especially at intersections near the outside boundary of the study area because these intersections would be minimally impacted by project traffic.

- Resurface and restripe Seventh Street from Sixteenth Street to Townsend Street to provide four travel lanes with bicycle lanes and sidewalks on both sides of the roadway to ensure adequate detour capacity and traffic and pedestrian safety. The Seventh Street pavement is currently in poor condition and needs repair, and sidewalks are inadequate. This measure would serve both traffic detoured due to baseball games and other existing and future users of this section of Seventh Street unrelated to ballgame traffic.

While baseball games would occur only about 80 days per year, the proposed detour would place unusual loads on Seventh Street on those days (400 - 1,400 vehicles per hour for an hour or more before and after each game) in addition to existing volumes of about 650 during the p.m. peak hour. An alternative to the full resurfacing would be to limit the improvements to the restriping and pavement repair necessary to accommodate the detoured ballpark-related traffic that would be needed about 80 - 85 days of the year.

- Restripe Terry A. Francois Boulevard from Mariposa Street north to the ballpark parking lot entrance to provide four travel lanes. A "keep clear" pavement marking could be provided opposite the Pier 52 boat launching ramp to aid in use of this ramp before and after ball games. A PCO stationed nearby could enforce the keep clear request. Some resurfacing and pavements repairs may be needed, but the extent of the improvement could be limited in recognition that these streets would only be used in this configuration to gain access/egress to the dedicated ballpark parking areas as well as to maintain access to waterfront land uses before and after ballgames.

- Convert existing 90-degree parking on east side of Main Street just south of Harrison Street to parallel parking to provide one through lane. This would reduce delay of through traffic substantially at all time periods.

- Restripe Townsend Street between Fourth and Seventh Streets to provide two travel lanes in both directions. This segment of Townsend Street is wide enough for two lanes in each direction but is currently left unstriped for freight loading and 90-degree parking. In order to provide two full lanes, these 90-degree parking spaces could be prohibited, at least during the hour before and after weekday afternoon games, and the hour before weekday night games. It should be noted that the restriping of Townsend Street to four lanes would preclude the provision of bicycle lanes on this street as proposed under the San Francisco Bicycle Plan. The long-term planning for the Townsend Street corridor should consider the trade-offs between the development of a four-lane street versus the inclusion of bike lanes.

Table V.B.3 shows the levels of service that would result after all of the proposed temporary and permanent intersection and street improvement measures (see Table V.B.2, pp. V.26 - V.31) are implemented at the 33 intersections that would be at a level of service E or F for one or more time periods for the existing-plus-project traffic with the detours and the preliminary traffic routing plan. During the 3:30 - 4:30 p.m. period after a weekday afternoon game, seven intersections would remain at LOS F and three would remain at LOS E after the street improvements were in place, compared with 30 intersections which would be at level of service F during this period under the detour and preliminary traffic routing plan without the improvements, and with 23 intersections at level of service F under the existing-plus-project condition (no detours or improvements).

TABLE V.B.3 •
EXISTING PLUS PROJECT INTERSECTION LEVELS OF SERVICE (With Improvements)

Study Intersections	Existing Redistributed[1] + Project Traffic (Detoured)				With Improvements			
	Weekday Afternoon 3:30-4:30 PM	Weekday Evening 6:30-7:30 PM	Weekday Evening 10:30-11:30 PM	Weekend Afternoon 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Evening 6:30-7:30 PM	Weekday Evening 10:30-11:30 PM	Weekend Afternoon 4:00-5:00 PM
King Street at:								
▸ Fourth Street	F	F	F	F	B	C	C	C
Townsend Street at:								
▸ Seventh Street[2]	F	F	N/A	N/A	E	D	N/A	N/A
▸ Fourth Street	F	F	F	F	D	C	B	D
▸ Third Street	F	F	F	F	D	D	D	D
▸ The Embarcadero	F	F	F	F	C	D	B	C
Brannan Street at:								
▸ Seventh Street[2]	F	N/A	N/A	N/A	E	N/A	N/A	N/A
▸ Sixth St/I-280 Ramps	F	N/A	N/A	N/A	C	N/A	N/A	N/A
▸ Fourth Street	F	F	N/A	N/A	C	D	N/A	N/A
▸ Third Street	F	N/A	N/A	N/A	B	N/A	N/A	N/A
▸ Second Street	E	N/A	N/A	N/A	B	N/A	N/A	N/A

Notes:
1. Existing Redistributed represents existing traffic counts redistributed to account for roadway improvements that are under construction.
2. Additional intersection analyzed under traffic routing plan.

N/A = Mitigation not required or intersection not analyzed.

TABLE V.B.3 •
EXISTING PLUS PROJECT INTERSECTION LEVELS OF SERVICE (With Improvements)

Study Intersections	Existing Redistributed[1] + Project Traffic (Detoured)				With Improvements			
	Weekday Afternoon 3:30-4:30 PM	Weekday Evening 6:30-7:30 PM	Weekday Evening 10:30-11:30 PM	Weekend Afternoon 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Evening 6:30-7:30 PM	Weekday Evening 10:30-11:30 PM	Weekend Afternoon 4:00-5:00 PM
Bryant Street at:								
▸ Sixth Street	F	F	N/A	N/A	D	D	N/A	N/A
▸ Fifth Street	F	F	N/A	F	F	C	N/A	B
▸ Fourth Street	N/A	F	N/A	N/A	N/A	D	N/A	N/A
▸ Third Street	F	N/A	F	F	D	N/A	B	C
▸ Second Street	F	N/A	N/A	N/A	D	N/A	N/A	N/A
Harrison Street at:								
▸ Sixth Street	F	N/A	N/A	N/A	C	N/A	N/A	N/A
▸ Fifth Street	F	E	N/A	E	C	C	N/A	C
▸ Fourth Street	F	F	E	E	F	F	B	B
▸ Second Street	F	F	N/A	N/A	F	D	N/A	N/A
▸ Essex Street	F	F	N/A	N/A	F	F	N/A	N/A
▸ First Street	F	F	N/A	N/A	F	F	N/A	N/A
▸ Fremont Street	F	F	N/A	N/A	D	C	N/A	N/A
▸ Main Street	F	N/A	N/A	N/A	D	N/A	N/A	N/A

Notes:
1. Existing Redistributed represents existing traffic counts redistributed to account for roadway improvements that are under construction.
2. Additional intersection analyzed under traffic routing plan.

N/A = Mitigation not required or intersection not analyzed.

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	Weekday Afternoon 3:30-4:30 PM	Weekday Evening 6:30-7:30 PM	Weekday Evening 10:30-11:30 PM	Weekend Afternoon 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Evening 6:30-7:30 PM	Weekday Evening 10:30-11:30 PM	Weekend Afternoon 4:00-5:00 PM
Folsom Street at:								
▸ Sixth Street	F	F	N/A	N/A	D	D	N/A	N/A
▸ Fourth Street	F	F	N/A	N/A	F	D	N/A	N/A
▸ Second Street	F	F	N/A	N/A	F	C	N/A	N/A
▸ First Street	N/A	F	N/A	N/A	N/A	F	N/A	N/A
Howard Street at:								
▸ Sixth Street	F	N/A	N/A	N/A	C	N/A	N/A	N/A
▸ Fourth Street	F	E	N/A	N/A	B	D	N/A	N/A
Sixteenth Street at:								
▸ Mississippi/7th Pennsylvania	F	F	N/A	N/A	D	A	N/A	N/A
▸ Third Street	F	F	N/A	F	E	D	N/A	C

Notes:

1. Existing Redistributed represents existing traffic counts redistributed to account for roadway improvements that are under construction.
2. Additional intersection analyzed under traffic routing plan.

N/A = Mitigation not required or intersection not analyzed.

TABLE V.B.3 •
EXISTING PLUS PROJECT INTERSECTION LEVELS OF SERVICE (With Improvements)

Study Intersections	Existing Redistributed[1] + Project Traffic (Detoured)				With Improvements			
	Weekday Afternoon 3:30-4:30 PM	Weekday Evening 6:30-7:30 PM	Weekday Evening 10:30-11:30 PM	Weekend Afternoon 4:00-5:00 PM	Weekday Afternoon 3:30-4:30 PM	Weekday Evening 6:30-7:30 PM	Weekday Evening 10:30-11:30 PM	Weekend Afternoon 4:00-5:00 PM
Mariposa Street at:								
▸ Third Street	F	F	F	F	D	D	B	B
▸ Illinois Street	N/A	E	N/A	N/A	N/A	A	N/A	N/A
Third/Fourth Streets	F	F	F	F	B	B	B	B
Embarcadero/Broadway	E	F	N/A	N/A	C	C	N/A	N/A

Notes:
1. Existing Redistributed represents existing traffic counts redistributed to account for roadway improvements that are under construction.
2. Additional intersection analyzed under traffic routing plan.

N/A = Mitigation not required or intersection not analyzed.

Source: Wilbur Smith Associates.

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During the 6:30 to 7:30 p.m. time period, four intersections would remain at LOS F as compared with 22 intersections at LOS F under existing-plus-project conditions with the preliminary traffic routing plan and no improvements, and 19 intersections that would be at LOS F under the existing-plus-project condition (without either the preliminary traffic routing plan or the recommended improvement measures for the plan).

After an evening game, at 10:30 - 11:30 p.m., no intersections would remain at LOS F, as the improvements would mitigate traffic conditions at the seven intersections that would have been at LOS F under the existing-plus-project condition with the preliminary traffic routing plan and detours. For this time period, five intersections would be at LOS F under the existing-plus-project condition without the preliminary plan and improvements. Similarly, after a weekend afternoon game, 4:00 - 5:00 p.m., no intersections would remain at level of service F with the preliminary traffic routing plan and improvements as compared with nine LOS F intersections under the existing-plus-project conditions with the preliminary traffic routing plan. Prior to the application of the detours and improvements, a total of eight intersections were at LOS F.

For each of the study time periods, there would be intersections that already operate at LOS E and LOS F under existing conditions and that would continue to operate at unacceptable levels of service with existing-plus-project traffic, including the application of the detours and the improvements. While the project would not cause significant impacts at these locations, potential improvement measures have been examined. During the post-day-game period (3:30 - 4:30 p.m.), seven intersections that currently operate at LOS F could not be mitigated. These intersections are: Bryant at Fifth; Harrison at Fourth, Second, Essex, and First; and Folsom at Fourth and Second. During the 6:30 - 7:30 p.m. post-night game period, four intersections would have similar conditions: Harrison at Fourth, Essex, and First; and Folsom at First.

Field observations revealed that these intersections already operate at very poor levels of service under existing conditions. Delay is usually caused by congestion on the freeway that

these intersections lead to (i.e., U.S. 101/I-80/Bay Bridge) and no immediate improvement measures at these local intersections (e.g., signal re-timing and road widening) would solve the congestion problem effectively. A temporary solution would be to assign PCOs to these intersections to ensure that freeway queues do not "spill" back to block the intersection itself and other "non-freeway" movements. This could reduce overall intersection delay.

Additional Transit Services

The MUNI Metro Extension (MMX), at four cars per train, is a mitigation measure assumed to be part of the transit facilities available for the project, based on the availability of rolling stock and on the fact that the ballpark would establish a demand for this level of service. The measure is described in detail in the analysis in IV.E. Transportation and Circulation, pp. IV.189 - IV.194. A four-car MMX service is not described a second time in this discussion and analysis of mitigation measures; nevertheless it should be considered a project-related mitigation measure without which transit demand from the ballpark would not be served, as described on p. V.50.

Certain additional transit services would be needed to maximize the use of transit by ballpark patrons and employees. These are, in addition to the proposed MUNI bus bridge and the added service on the MUNI Metro MMX light rail service, other transit services that are assumed to be provided and are described below under Transit Mitigation Measures, pp. V.48 - V.54. The added services include a ballpark-oriented ferry service and added CalTrain services. In addition, a program to be implemented by the Giants which would encourage and provide incentives for the use of transit to the ballpark is recommended. These transit measures would serve to lessen the regional impact of ballpark traffic on the freeway network and on the freeway ramps serving the key access/egress routes for the ballpark.

Ferry Service

- During the season appropriate ferry service could be provided for all ballgames by up to five boats and landing opportunities adjacent to the ballpark (potentially at a double-berthed ferry landing float), provided that such service is consistent with the regional ferry service plans and studies described below, does not interfere with pedestrian circulation or South Beach Harbor operations, provides for the maximum feasible public access for both ballpark and non-ballpark uses, ensures public safety, and that the location proves consistent with the maximum opportunities for year-round use.

The Giants would participate in the public-private partnership of major Bay Area governmental agencies and ferry service providers, including BCDC, MTC, the Bay Area Council, BADCAT/BAEF, GGNRA, the US Park Service, Caltrans, the Golden Gate Bridge District, AC Transit, the Port of Oakland, and the Blue and Gold Fleet and other public and private ferry operators, which is currently proposing to undertake a study of the feasibility of an expanded Regional Ferry Transportation System. At the conclusion of the study, the Giants would make good faith efforts to assist in implementing feasible study recommendations relating to ballpark ferry service. At that time, the Giants would also undertake measures to enhance the attractiveness of ferry service as a mode of transportation for ballpark events.

Because of its convenient location, it is expected that ferry service would become a popular way to reach the ballpark for those able to access the ferry at their origin points. Ferry service is described and analyzed in more detail in Chapter VII. Variants to the Proposed Project, pp. VII.1 - VII.9. The following discussion is limited to transportation issues.

Ferry service would be provided to the ballpark from Vallejo, Larkspur and Sausalito and/or Tiburon in the North Bay, Oakland and Alameda in the East Bay, and from Fisherman's Wharf/Pier 39 and the Ferry Building in San Francisco. The San Francisco waterfront

shuttle service would be provided by either a dedicated boat or as a continuation of a route from Sausalito that would stop by the Wharf and the Ferry Building on its way to the ballpark.

All of the existing suburban ferry landings are proposed to be served by the ballpark ferry system. Future ferry terminals could be added to the service. Currently a terminal in Berkeley near the Golden Gate Fields Race Track is under consideration as part of the Bay Area Ferry Plan. Advantages of such a terminal would be its location adjacent to the Eastshore Freeway and its space for a large parking lot.

Parking at the suburban ferry terminals is a critical need in order to make the ferry service to the ballpark successful. Parking for weeknight and weekend games is available at Vallejo, Larkspur, Oakland and Alameda. Tiburon would have a limited supply of parking available for weeknight

games. Weekday game parking would be available at Vallejo, Oakland and, to a limited extent, at Tiburon. Because ballpark fans would be arriving at the ferry terminals to park well after the commuter arrival peak is over, they would not be displacing potential ferry commuters, but would be taking advantage of any remaining available parking. Some increases in traffic around these terminals would occur, but generally would be much less than traffic levels during the commute peak periods. Use of the ferry by ballpark fans would reduce traffic on regional highway routes from the North Bay and the East Bay.

The forecast number of ferry passengers assuming this scenario and level of service is shown in Table V.B.4. The number of patrons is conservatively assumed to be approximately 500 in all scenarios except for post-game weeknights when highways are less congested and temperatures are lower, leading to reduced ferry patronage. On weekday nights more patrons are assumed to use the ferry to arrive at games (approximately 525) compared with the number of persons riding the ferry after a game (about 375). This assumption is based on the tendency of persons riding the ferry to a game to arrange to ride home with someone who has a car at the game. This is a phenomenon that is currently experienced by BART at the Oakland Coliseum.

TABLE V.B.4
FORECAST FERRY USE BY ORIGIN LOCATION

	Weekday Afternoon	Weekday Night		Weekend Day
Origin Location	**3:30-4:30PM**	**6:30-7:30PM**	**10:30-11:30PM**	**4:00-5:00PM**
East Bay				
Alameda	230	250	175	189
I-80	117	72	63	152
North Bay				
Marin	84	126	85	75
Other	71	76	51	90
Total	502	524	374	506

Source: Wilbur Smith Associates.

CalTrain Service

The CalTrain Joint Powers Board (JPB) has passed a resolution supporting the provision of CalTrain service for events at the ballpark.[4] The JPB would work with the project sponsor and other appropriate parties to develop a service and financial program to accommodate Peninsula ballpark patrons within the financial and operations capacities of its member agencies. In order to serve ballgames, it is recommended that JPB take the following actions:

1. Add three to five cars to midday (10:30 a.m. to 12:30 p.m.) trains and to early rush hour trains (3:45 to 4:30 p.m.) for weekday afternoon games.
2. Add a train for departures about 20 minutes after the end of weekday night games.
3. Add two cars for departing trains after weekend day games.

Transit Incentive Program

As part of the project, the project sponsor would develop and implement a program for the ballpark that encourages transit use and other alternative modes of travel to the ballpark. This program should be designed and implemented prior to the opening of the ballpark, and should continue on an ongoing basis. The purpose of the transit incentive program would be to develop strategies to reduce ballpark parking demand through education, marketing and incentives. Such measures might include charging for parking in the dedicated lots (this fee could be added to the price of tickets purchased in advance); concession discounts to fans who show evidence of riding on transit or ballpark shuttles; and an informational campaign regarding transit schedules, availability and convenience (to be provided, for example, by phone recording, on an Internet website, and/or at the time tickets are purchased). The price of parking is an important transit incentive. The Giants should price ballpark parking at a relatively high level, to encourage transit use.

Travel Demand Management

The transportation mitigation measures for the ballpark must be designed to allow changes to occur as needed to deal with changes in travel patterns, study area characteristics, and the nature of attendance at ballpark events. For example, over time it is likely that ballpark patrons would learn the best ways to access and egress the ballpark, and as a result some of the traffic control measures may not be necessary. There is also a need for some continuing programs as outlined in the following discussion.

Transportation Demand Management

As part of the project, the project sponsor would develop a transportation demand management (TDM) plan for employees and concessionaires. The plan could include, for example, providing employees and concessionaires with free or subsidized transit passes to encourage transit use and reduce parking impacts.

Public Information/Outreach Programs

Public information/outreach programs should include the following types of actions:

- The project sponsor should work with transit and private parking operators and game ticket distributors to offer transit and parking passes when fans purchase tickets.
- Consider scheduling some of the approximately 13 weekday afternoon games for a late 3:30 - 4:00 p.m. start time instead of a 12:35 p.m. start. The average game lasts three hours and would end at 6:30 - 7:00 p.m. Even when games ended earlier, it would be convenient for fans to extend their stay in the area to avoid the traffic. This would reduce project traffic and transit travel during the height of the peak commute traffic period (the Lefty O'Doul Bridge would be open to vehicular traffic during the ballgame and closed to vehicles before and after games) and the time when MUNI resources are fully

deployed. Parking impacts would also be less than those associated with the afternoon game.

- Develop a brochure, information packet, and/or internet web page providing full information about ballpark travel options.

Motorist Information System (MIS)

As part of the project, the project sponsor would develop an MIS program to provide motorists and all travelers to and from the ballpark with real-time information about traffic, parking, and transit before and after games. It could include the following types of measures:

- Use of existing sports and news oriented radio stations to broadcast travel conditions.
- Establishment of a cellular phone hot-line which provides up-to-date travel information.
- Participation in the ongoing Bay Area TravInfo system which provides up-to-date travel data to participants. TravInfo is a program sponsored by the Metropolitan Transportation Commission and Caltrans to provide travelers with access to accurate, real-time information regarding travel conditions.
- Implementation of a low-frequency radio station(s) to provide motorists with traffic and parking information in the vicinity of the ballpark.

Other Mitigation Issues

- A number of improvement measures could be included in the overall Transportation Management Plan; some of them were suggested in comments on the Draft EIR. These measures could be considered by the Ballpark Transportation Coordinating Committee and implemented if conditions warrant and if funding is available.

- adjust the traffic routing plan for time of day, as appropriate;

- coordinate and modify traffic routing plan and Transportation Management Plan based on ongoing changes in development and circulation that would occur with Mission Bay development;

- monitor traffic in Potrero Hill and South Beach residential neighborhoods, and consider temporary barriers or assigning PCOs to discourage ballpark traffic in residential neighborhoods;

- provide for access to China Basin Landing buildings and other uses located on streets temporarily closed as part of traffic routing plans;

- review effectiveness of special event-day traffic signal timing on a regular basis and adjust as necessary;

- recommend consideration of residential permit parking programs for residential neighborhoods near the ballpark site if they appear to be appropriate for further study;

- Assuming the meter replacement program planned by the Department of Parking and Traffic (DPT) is funded by the Board of Supervisors, residents and business owners in the South Beach area could request that the DPT install electronic (programmable) meters in commercial areas which could be affected by overflow parking from the ballpark. The neighborhoods could request that installation of meters in this area be given priority over other areas which are scheduled for meter replacement. Generally, existing commercial areas should be examined north of the Channel, roughly bounded by Fifth Street to the west, Brannan to the north, and The Embarcadero to the east. Once Mission Bay is developed the feasibility of installing programmable meters south of the Channel should also be investigated.

- If the City or the Port also installs programmable meters in commercial areas near the ballpark, the boundaries of the residential permit program should be coordinated with the locations of the programmable meters.

- Recognizing that permit parking programs are only as effective as their enforcement, Parking Control Officers could be assigned to enforce residential permit parking restrictions in the South Beach and Potrero Hill areas on game or event days. As discussed on p. V.6, Parking Control Officers (PCOs) would control and route traffic before and after ballgames or events. A portion of these officers also could be available before games to enforce parking restrictions and serve as a visible deterrent to potential violators. Shortly after a game or event begins, additional PCOs would be available to ticket illegally parked cars.

- Parking on Terry A. Francois Boulevard could be restricted to a 2-hour limit, which would be too short and inconvenient for ballpark fans. Enforcement would be necessary during games to make this measure effective. Non-ballgame users of the parking who wanted to stay longer than 2 hours would be inconvenienced.

- Special parking passes could be made available for businesses, the Pier 52 boat launching ramp and other key activity centers along the waterfront. Passes would be placed on the dashboard of the parked car during ballgames. Cars without passes would be ticketed during the game. Strict enforcement of the pass program would be necessary, as some abuse would likely occur by some ballpark fans.

- Parking meters with a 2-hour limit or programmable meters could be installed such as those used in Denver near Coors Field. During games, the 2-hour limit would discourage ballpark fans. Non-ballpark related users could return to their cars and add money to the meter to extend their time limits. However, these parkers, especially those using the boat launch ramp, would be inconvenienced by having to "feed the meter" every 2 hours. With the computerized meters, the time limits could automatically be extended during non-game time periods.

- Within 5 years after opening of the ballpark, the project sponsor could develop a permanent parking plan, if necessary, to address the long-term parking needs of the stadium. The plan should identify a permanent plan to provide sufficient dedicated parking spaces, and should be integrated with other travel demand management strategies such as those described on pp. V.43 - V.45. Development and implementation of the plan should be coordinated with the Ballpark Transportation Coordinating Committee.

- Parking in off-street parking lots and garages located in South Beach could be restricted on game or event days to fans who have pre-paid parking passes that are displayed on the vehicle dashboard. Lot operators would need to have agreed to this in advance, and they and Parking Control Officers would be responsible for enforcing this measure.

- A series of small pedestrian guide signs could be developed and installed which would show pedestrians the most appropriate routes to the ballpark and guide them away from neighborhood areas.

- On Second Street between Townsend and Brannan Streets the effective sidewalk width should be increased through a program of removing and/or relocating street furniture and other obstructions.

Special Events

There is the potential that up to five large special events could be held at the ballpark annually. A large special event would be any event that was designed for more than 42,000

persons to attend. Also, an event could be scheduled to begin or end during the weekday afternoon commute period. While such events are likely to be unusual and to occur infrequently (see discussion in IV.E. Transportation and Circulation, p. IV.103), they require special transportation mitigation measures in addition to those identified for a sellout ballgame. This is because the impacts of such special large events would likely be greater than those identified for a sellout ballgame. It is not practical or meaningful to attempt to evaluate all the possible combinations of potential adverse impacts which could occur at each possible type of special event. In general, however, the demand for parking, for transit use, and pedestrian space would increase, and the levels of traffic generated in the study area would be higher than that identified for a sellout game.

As explained in IV.E. Transportation and Circulation, pp. IV.101 - IV.103, a large special event attended by 50,000 people would add up to 25 percent more traffic on freeways and local streets, up to 25 percent more demand for transit services, and a greater parking demand. Additional transit capacity would need to be provided, particularly by MUNI and CalTrain. PCOs would likely need to be stationed at additional intersections to assist with traffic control before and after the event. Expanded and specialized public information regarding the best options for transportation to and from the event would need to be widely disseminated.

The infrequency of such events would not warrant further permanent mitigation such as additional dedicated parking, street improvements, and other physical improvements to the transportation infrastructure. It is recommended that such events should be treated like any other major special event in San Francisco, requiring a planning effort that would include the measures identified for a sellout ballgame, but could also include additional measures depending on the nature of the event. In planning such an event, the project sponsor would need to develop the appropriate transportation plans and information to secure the normal approvals to hold the event. The Ballpark Transportation Coordinating Committee could serve as the review board for such special events. The project sponsor would notify the committee of any such events and submit a special transportation plan defining the measures

to be implemented in order to mitigate the impacts of the event which might go beyond those of a normal sellout ballgame. As noted above, in addition to the measures identified in this section for sellout games, additional transit services could be provided, and the City and/or the project sponsor could reserve additional parking for the event. Additional PCOs and a special public information program could be used to further control the impacts of the event. The committee would also direct the project sponsor as to which additional steps, such as approvals from various City departments or other agencies, are required or should be implemented before the event could be held.

- There would be non-baseball events at the ballpark which would have a similar or smaller attendance than the 39,500 persons associated with a sellout ballgame. These events would include ballgames with less than a sellout crowd and the other non-ballgame events that could occur as noted earlier. The impacts of a smaller event would be similar to those associated with a sellout ballgame, but would be smaller or lesser in scale. For example, fewer intersections would be impacted, and the demand for transit and parking would be less. As the impacts of smaller events would be less, the extent of the mitigation required would also be less.

As noted on p. V.5 of the EIR, it would be the pedestrian flows on the Lefty O'Doul Bridge that would "trigger" the need for the mitigation program including the traffic routing plan. This is because, when the number of pedestrians crossing the bridge exceeds the capacity of the sidewalks, pedestrians would spill onto the roadway to bypass the congested sidewalks. When this situation would occur, the bridge would need to be closed and the traffic routing plan put in place.

The capacity of the bridge sidewalks is approximately 5,000 persons per hour. Flows above this level would result in congestion on the sidewalks. If all the assumptions about parking distribution, transit use, and travel distribution developed for the sellout game were the same for a smaller event, a crowd of 19,000 persons would be the level that would put 5,000 fans per hour on the bridge. However, it is unlikely that all these assumptions would be constant.

With a smaller crowd, people could be expected to try and leave the ballpark sooner, to take advantage of the available parking, and not to use transit as much. The result would be a larger proportionate number of persons using the bridge. Potentially, events with attendance in the range of 5,000 to 9,000 persons would generate pedestrian flows across the bridge that would exceed the capacity of the sidewalks for at least fifteen minutes. Thus, even events of this size would trigger a need for the mitigation program, although it could be scaled down somewhat. Even very small events, less than 5,000 persons, would require the use of crowd controls and PCOs, at least at the King Street intersections near the ballpark.

Freeway and Ramp Measures

The City and County of San Francisco has a general policy not to increase the capacities of freeway on-and off-ramps[5], and, consistent with this policy, no specific, feasible improvements are available to address the impacts of ballpark traffic on freeways and freeway ramps. However, the transit-related mitigations described above and the travel demand management measures described below would reduce the impacts of ballpark traffic on these facilities.

Cumulative Traffic Mitigation

Mitigation measures that would reduce traffic impacts due to cumulative growth, including the ballpark, would involve widening streets and expanding freeway and ramp capacities. These kinds of measures would not conform with objectives and policies in the *Transportation Element* of the City's *General Plan*.[6] The project would not contribute to cumulative impacts on an every-day basis, unlike commercial developments that attract daily commuters. Therefore, the project's occasional contribution to cumulative traffic impacts would not justify expanding the street and freeway systems. Measures such as provision of ferry service and other transit incentives would reduce the project's contribution to

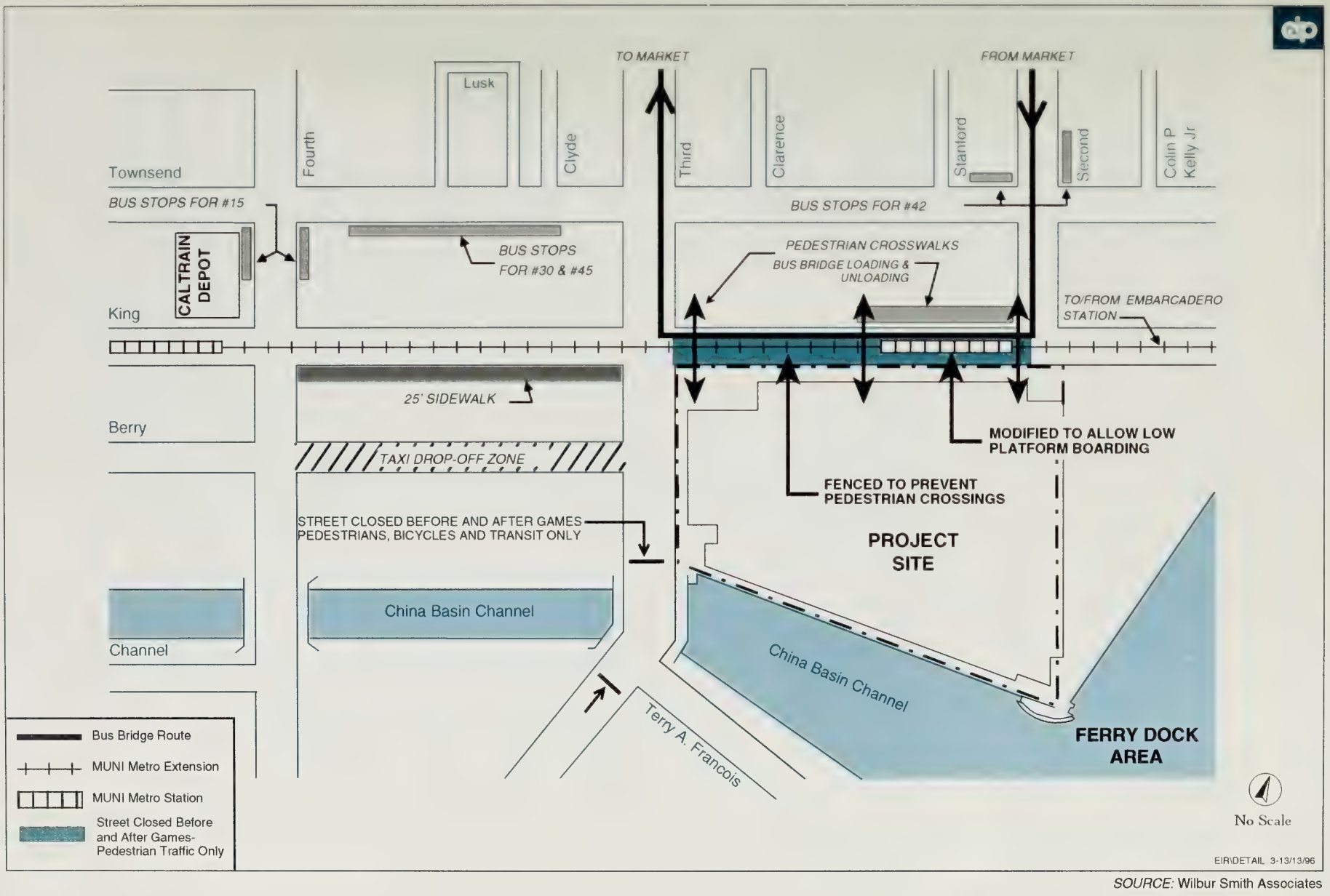
cumulative traffic impacts on freeways and streets more effectively than providing infrastructure to improve freeway and intersection levels of service.

TRANSIT MITIGATION MEASURES

The increased traffic volumes associated with ballpark events and the related increases in pedestrian traffic would pose difficulties in terms of the operations of transit services in the study area. The following measures have been identified to address these impacts (see also Figure V.B.4).

MUNI Metro Extension

The MUNI platform on King Street at Second Street contains adequate space to accommodate patrons under most pre-game conditions, but would be inadequate under many post-game conditions. Alternative or supplementary queuing areas need to be identified. Consequently, in order to facilitate pedestrian movement and allow more room for queuing, it is proposed to close King Street between Second and Third Streets for approximately one hour before and after games (see Figure V.B.4) as noted in Traffic Routing Plan, pp. V.6 - V.17. Before games, the platform would be used as under normal operations. After the game, King Street would be closed and the LRT vehicle would be on the south side of King Street (the ballpark side of the platform) to allow patrons to enter from the street as well as the platform. Communications with MUNI staff indicate that it is possible to open doors on both sides of the new Breda cars at one time, but for safety reasons MUNI is requesting that the manufacturer change controls to eliminate this possibility.[7] Therefore, it is recommended that the MUNI board passengers at the Second and King Station from the street side when high attendance would create queuing problems on the platform. At those times, the platform would be reserved for wheelchair loading (and possibly others who have difficulty



SOURCE: Wilbur Smith Associates

GIANTS BALLPARK

Figure V.B.4 Transit Mitigation Measures

entering by the steps) and doors on the platform side would be opened only when needed to accommodate these persons.

Street loading can occur on King Street with some minor modifications to the right-of-way, which is not currently designed for passenger low-level loading. The following station modifications would need to be made prior to the station's use as a low-platform boarding station:

A. For the eastbound raised median side east of the midblock crosswalk:

- Removal of cobblestones and replacement with a flat-boarding surface.
- Extension of the curb about 5-6" toward the tracks to close the gap between the curb and the vehicle.
- Covering of conduits.
- Use of tree grates to replace open pits.
- Relocation of drains due to curb relocation.
- Relocation of "Second Street" sign by DPT.

B. For other locations:

- Extension of the midblock crossing to the westbound lane of King Street; installation of traffic signal at that location.
- Some limited signs to indicate procedures for post-game activity.
- Possibly some moveable barriers with storage for the barriers, depending on fare collection process.

It is also important for safety and transit operations reasons that persons cross the light rail tracks only at specified crosswalks. It is recommended that low fencing be provided on at least the south side of the trackway (and possibly the north side as well, if required) between the crosswalks west of the platform and the crosswalk at Third Street.

The following mitigation measures are recommended to facilitate MMX operations:

1. Close King Street between Second and Third Streets before and after games as specified above.

2. Open doors on the street side of the vehicle after games. Modify the trackway paving to allow for boarding on the street side.

3. Fence the transit trackway between crosswalks.

4. Have proof-of-fare payment in effect, which requires patrons to display proof that they have paid the fare only upon request by a MUNI official. MUNI personnel could check for proof-of-fare payment in the boarding area, on the train, or at departure stations.

5. Provide MUNI ticket dispensing machines in the ballpark so that fans can purchase them during games.

Transit Priority

It is important that surface transit be an attractive mode to the ballpark and that the bus bridge provide a reliable travel time. Consequently, measures to expedite the movement of buses in a north-south direction along Second, Third and Fourth were investigated. Second and Third Streets are routes for the bus bridge and 15 bus while Third and Fourth Streets have frequent bus service via the 30 and 45 buses. MUNI has proposed that the 42 bus be moved to Second Street when the MMX goes into service.

It is recommended that transit lanes be provided and that parking be removed on the east side of Third Street during at least those times that traffic congestion impedes bus traffic (after weekday afternoon games and before weekday night games). It is also proposed that PCOs be positioned along Second Street as required during these times.

The transit lanes should be instituted from 3:00 to 5:00 p.m. after weekday games and from 6:00 to 8:00 p.m. on weekday night games. The lanes would be created by removing parking on the east side of Third Street between King and Market Streets. There may be some difficulty in informing persons of which days these lanes would be instituted. It is suggested that the lanes initially be tested during game days. An alternative, which might be less confusing to drivers, would be to test the lanes full time throughout one baseball season. If successful, they could then either be made permanent through the year or season, or else DPT could determine if there is an expeditious means of informing parkers when tow-away zones are in force.

If a bus-only lane is implemented, capacity along Third Street would decrease, and delay would increase at intersections, especially those near the proposed project site. During the weekday afternoon post-game (3:30 - 4:30 p.m.) study period, the intersection at Townsend and Third Streets would operate at LOS F as a result of a bus lane. Without a bus lane, this intersection would operate at LOS E. The intersection at Third and Brannan Streets would

continue to operate at LOS E with a bus lane. All other intersections would still operate at LOS D or better with a bus lane. All of the study intersections on Third Street during all other study time periods would continue to operate at LOS D or better with a bus lane.

Second, Third, and Fourth Streets north of the Channel, and Third and Fourth Streets south of the Channel would serve as important traffic access and circulation routes for the ballpark, and for MUNI buses and charter buses. PCOs at the intersections along these streets would be trained to provide priority to buses, and shuttles and emergency vehicles in controlling the operations at these intersections. This would include extending the "green-time" given to an intersection approach if a bus is in the traffic stream, and holding traffic briefly to allow buses to clear the intersection in advance of the traffic queue. The lack of a transit priority access route, such as that available at 3Com Park, may inhibit transit and charter bus operations. These operations should be monitored and the need for additional transit priorities should be reviewed periodically as is now done at 3Com Park.

Bus Bridge

The following operating plan has been developed for the bus bridge which is proposed as part of the project.

Pre-game buses would off-load on the north side of King Street and passengers would cross at crosswalks at either Second or Third Streets (see Figure V.B.4, p. V.49).

Post-game, patrons would cross either at the crosswalks at Second Street or at Third Street. Since both sides of King Street would be closed, the crosswalk just west of the LRV platform could also be used to achieve greater passenger flow. The latter movement presents potential conflicts between pedestrians and both MUNI Metro and buses heading back to Market

Street. It would be necessary to have PCOs in the area keeping the tracks clear when MUNI trains are operating and stopping pedestrians when buses are ready to depart.

The maximum number of bus bridge patrons would occur on a weekday afternoon when almost 3,600 persons are projected to use this system in the hour after the game. Given this volume, it would be advisable to board more than one bus at a time and move up to three out at once. The boarding should occur on the portion of King Street closest to the Second Street intersection where the sidewalk is wide enough (12 ft.) to allow for orderly movement and queuing. To avoid delays collecting fares after a game ends, it is suggested that round trip fares be collected for passengers boarding the buses near Market Street before the game.

Bay Area Rapid Transit

Capacity on BART was determined to be available (see IV.E. Transportation and Circulation, pp. IV.195 - IV.196) so no special mitigation measures have been developed.

CalTrain

CalTrain operations would not be adversely impacted by ballpark events, assuming that the service improvements outlined earlier (see pp. IV.86 - IV.87) are implemented. The pedestrian mitigation measures in Table V.B.5, p. V.59, include adequate capacity for pedestrians to walk to and from the CalTrain station before and after games. An additional train is recommended to serve ballpark patrons after weekday night games, and additional cars would be added to other trains to provide adequate capacity for all games as described above on p. V.43.

Cumulative Transit Mitigation

Cumulative growth in the greater downtown, including areas around the project site, suggests that expansion of MUNI services may be warranted by 2015. The planned MMX service could be increased by reducing headways between vehicles without infrastructure expansion. The Bayshore Light Rail service would also expand transit availability in the project area. Rerouting existing lines to serve the Mission Bay area, as described in the Mission Bay EIR,[8] would improve transit service to the area and reduce impacts on existing lines; these extensions are not yet proposed or funded, in part because substantial development has not yet occurred in the Mission Bay area. Shuttle service, provided either by MUNI or by private operators, connecting the project area with Market Street Metro and BART services and with the Transbay Terminal and the Ferry Building, but without other intermediate stops, would encourage greater use of regional transit. While these kinds of expanded transit services would help reduce cumulative impacts on MUNI, and could improve transit access to the project site, the greatest impact on transit service from the ballpark would occur following weekday afternoon games. Because relatively few weekday afternoon games would be played each year—about 13—the project alone would not justify implementation of major transit service expansions beyond those discussed above such as the bus bridge, ferry service directly to the ballpark, and additional CalTrain service.

PEDESTRIAN MITIGATION MEASURES

The street closures proposed adjacent to the ballpark are designed to assure adequate capacity for pedestrian flows before and after games. In addition to the closures, other improvements necessary to address pedestrian-related impacts are presented in the following discussion. The pedestrian improvements have been coordinated with the traffic improvements and the traffic mitigation analysis to assure that the impacts of any sidewalk widenings, street closures, or other changes in the availability of streets are accurately reflected.

Closure of Lefty O'Doul Bridge

The Lefty O'Doul Bridge on Third Street and its counterpart, Peter Maloney Bridge on Fourth Street, are historic bascule lift bridges. Because of their historic designation, significant modifications to the bridges to increase traffic and/or pedestrian capacity would be difficult. There is, however, a current effort underway by the City to raise the deck level of the Lefty O'Doul Bridge several feet. This is because the deck is currently only about one foot above the high water mark. There may be an opportunity to introduce some improvements to the deck as part of this project, e.g., improving the surface of the pedestrian walkways. However, there does not appear to be any potential for widening the bridge structure.

It is proposed to close the bridge to vehicular traffic (except MUNI) one hour before and one hour after the game in order to allow pedestrians and bicyclists full use of the bridge. It would be necessary to resurface the bridge with a material more amenable to walking. This could involve use of a temporary surface which would be put in place only before ballgames and removed after the game is over. Such a surface could help distinguish the pedestrian area from the area reserved for transit.

A new bridge is an alternative to improving the existing structure(s). In order to maintain current standards for navigation access into China Basin Channel, any bridge would have to be 65 to 70 ft. in height above the high water mark or would have to be a lift bridge. For pedestrians, a permanent bridge of the required height over the water would be impractical. The required ramps or stairs would be a major inconvenience, and elevators would most likely be needed at either end for the disabled. An auto bridge of this height would also be impractical due to the length of the approaches, approximately 1,200 ft. on either side, that would be required. As a result, the only potentially viable option for a new bridge would be a lift bridge.

Three options for a new bridge were considered. One would be a pedestrian/bike lift bridge located east of the Lefty O'Doul Bridge with its north end directly in the ballpark site. This bridge would need to have a deck 20 to 28 ft. wide to accommodate all of ballpark pedestrian flow from south of the Channel with a one-hour period at level of service C. This bridge would be a lift bridge to provide for navigation access. Such a bridge would provide sufficient pedestrian capacity before and after games assuming that the potential needs for bridge openings during these times could be avoided or minimized.

The second option would be a new auto bridge immediately west of the Peter Maloney Bridge. This bridge would be a lift bridge and could be constructed as a "twin" of the existing bridge to minimize impact of the new bridge on the historic character of the existing bridge.

The third option would be the construction of the Owens Street Bridge that is currently part of the long-range plan for the Mission Bay project. It would be too far away from the ballpark to offer much improvement for pedestrians, but might offer some additional traffic capacity.

The environmental implications of a new bridge are a major factor in terms of its feasibility, as a new crossing of a navigable waterway would involve a number of environmental clearances from federal and state agencies. Impacts could include issues of Bay fill, water quality, visual impact, historic resources, and navigation. Construction of a new bridge over the Channel could cause temporary water quality impacts such as sedimentation from stormwater runoff during construction at or near the water's edge, accidental release of construction pollutants such as petroleum products, and turbidity from barge activity if any construction activities were to take place from barges in the Channel, similar to but of a lesser scale than impacts described in IV.J. Water Quality and Aquatic Ecology. Water quality impacts would be limited by the requirement to prepare a Storm Water Pollution Prevention Plan, as described on pp. IV.306 - IV.311. Depending on the design of a new

bridge, it could interrupt views of the existing historic Lefty O'Doul Bridge from various shoreline vantage points on both sides of the Channel, including the project's proposed Port Walk (see III.C. Visual Quality and Lighting). A new bridge might increase the time it takes boats to travel into and out of the Channel, as an additional lift action would need to be requested and implemented, although the delay would not likely be more than a few minutes, similar to that now experienced for the Lefty O'Doul and Peter Maloney Bridges.

Note, however, that the mitigation plan proposed for the existing traffic plus ballpark conditions does not indicate a need for a new bridge if the Lefty O'Doul Bridge is closed to traffic before and after games. In fact, having this section of Third Street open to general traffic would conflict with transit and pedestrian operations around the ballpark site. If the proposed detour were not adopted and the Lefty O'Doul Bridge could not be made available for pedestrians, there would be a definite need for a new bridge for pedestrians. The need for a bridge, however, will also be examined as part of the planned MUNI Bayshore Extension Project and Catellus' plans for Mission Bay south of the Channel. Both programs currently include consideration of new Channel crossings.

Berry Street Sidewalk and/or China Basin Channel Walkway

A pedestrian/bicycle connection from the project site through to Seventh Street is needed for pedestrian and bicycle traffic. The connection could be located on Berry Street as a bike/pedestrian path; this would be consistent with Berry Street's designation in the *Transportation Element* of the City's *General Plan* as a neighborhood network connection street east of Fourth Street. Alternatively, it could be a new path along the north edge of China Basin Channel. This would be on China Basin Building and Catellus Development Corporation property.

Crosswalk Improvements

Changing the signal timing at the intersections of King Street at Second Street and King Street at Third Street would provide post-event signal phasing allowing pedestrians more green time to cross.

As indicated in Table V.B.5, all identified pedestrian impacts would be improved to acceptable levels of service with implementation of these measures.

TABLE V.B.5
MITIGATION FOR SIGNIFICANT PEDESTRIAN IMPACTS

Location	Future Flow/SL	Recommended Mitigation	Mitigated Future Flow/SL
Third St./King St. south-side crosswalk	93.5/OC		12.0/C
King St. between Second and Third		Close King St. between Second and Third Streets and close Third St. between King St. and Fourth Streets for one hour before and after games. The entire bridge deck plus the eastbound lanes of King Street become available to pedestrians. Modify signal timing to allow more time for pedestrians.	
▸ south-side sidewalk	33.4/OC		5.3/A
Third St. between Townsend and King			
▸ east-side sidewalk	16.3/NC		13.9/C
Third St. between King and Bridge			
▸ east-side sidewalk	14.8/NC		1.8/A
▸ west-side sidewalk	34.6/OC		1.8/A
Third St. on Lefty O'Doul Bridge			
▸ east-side sidewalk	14.1/NC		1.8/A
▸ west-side sidewalk	14.7/NC		1.8/A
Third St. between Bridge and Fourth Street	28.6/OC		1.8/A
▸ east-side sidewalk	40.1/OC		1.8/A
▸ west-side sidewalk			
Second St./King St.		Close intersection to cars, allow 30% signal time to all-way walk, remainder to buses.	
▸ east-side crosswalk	16.0/NC		3.5/A
▸ west-side crosswalk	50.6/OC		4.1/A
Third St./Folsom - east-side crosswalk	17.4/NC	Change % walk time from 13% to 30% during events, or widen crosswalk to 20'0".	13.3/C 8.5/B

Notes:
Flow in persons per minute per foot.
SL = Service Level (see Appendix C, Table X.C-7, p. A.119).
OC = Over Capacity (25 or more pedestrians per minute per foot) Unacceptable.
NC = Near Capacity, congested or jammed (14-25 pedestrians per minute per foot) Unacceptable.

Source: Wilbur Smith Associates.

NOTES - Transportation and Circulation

1. Whitlock, Edward, M., P.E., *Parking for Institutions and Special Events*, The Eno Foundation for Transportation, Inc. 1982, p. 33.

2. Denver Metropolitan Major League Baseball Stadium District, *Coors Field Transportation Management Program*, August 1994.

3. City of San Jose Department of Streets and Parks, *San Jose Arena Transportation and Parking Management Plan*, June 1994.

4. Peninsula Joint Powers Board, Resolution No. 1996-39, November 14, 1996.

5. City and County of San Francisco, *General Plan Transportation Element*, Objective 3, Policies 3.1 and 3.2; Objective 18, Policy 18.3.

6. City and County of San Francisco, *General Plan, Transportation Element*, Objective 3, Policy 3.1; Objective 11, Policy 11.2; and Objective 18, Policy 18.3.

7. E-mail from Janet Gallegos, Project Coordinator, Booz, Allen & Hamilton, Inc., to Elaine Cartwright, MUNI Senior Project Manager for the LRV2 Procurement, San Francisco Municipal Railway, dated November 13, 1996.

8. City and County of San Francisco, *Mission Bay Final EIR* (86.505E, certified August 1990), pp. VI.E. 63 - 67. A copy of this report is on file for public review at the Office of Environmental Review, Planning Department, 1660 Mission Street, San Francisco.

C. NOISE

CONCERT NOISE

Measure Not Included as Part of Project

Concerts at the ballpark featuring live amplified music without limits on maximum noise levels should be limited to about five per year. Additional concerts should be restricted as follows: project sponsor would perform a sound test, and on the basis of this test, establish a limit on music noise in the ballpark that would result in increases in exterior noise at representative residential receptors in the adjoining neighborhood of no greater than 3 decibels above the then-existing ambient hourly average (L_{eq}) noise levels at those receptor locations. With this mitigation measure, during lulls in the traffic and other community noise sources, music would remain detectable at locations in the vicinity of the ballpark because of music's tonal and percussive character, but would not cause substantial adverse community impact.

PILE-DRIVING NOISE

Measure Included as Part of Project

The project sponsor would consult with the Department of Public Works to determine the times when pile driving would cause the least disturbance to neighboring uses. The project sponsor would require the construction contractor to limit pile-driving activity to result in the least disturbance to people. This could require a work permit from the Director of Public Works pursuant to San Francisco Noise Ordinance Section 2908, if pile driving during nighttime hours were required.

Measure Not Included as Part of Project

As a condition of the contract, the project sponsor should require the construction contractor to predrill holes for piles (if feasible, based on soils) to the maximum feasible depth, to minimize noise and vibration from pile driving. The actual pounding from pile driving would occur during a five- to eight-minute span per pile, if pre-drilling is feasible.

D. AIR QUALITY

CONSTRUCTION PM_{10}

Measures Included as Part of Project

As conditions of the construction contract, the project sponsor would require the contractor to implement the following mitigation program, developed from the Bay Area Air Quality Management District's (BAAQMD) master list of feasible PM_{10} control measures,[1] at all construction sites of the proposed project:

- Water all active construction areas at least twice a day, or as needed to prevent visible dust plumes from blowing off-site;
- Use tarpaulins or other effective covers for on-site storage piles and for haul trucks that travel on streets;
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all *unpaved* parking areas and staging areas at construction sites;
- Sweep all *paved* access routes, parking areas, and staging areas daily (preferably with water sweepers);
- Sweep streets daily (preferably with water sweepers) if visible amounts of soil material are carried onto public streets; and
- The BAAQMD recommends suspending excavation and grading on large construction sites when high winds cause visible blowing dust. This measure would be included by the project sponsor as a condition of the construction contract.

The BAAQMD has determined that the implementation of the above measures would be sufficient to establish that emissions from construction activities would be less than significant.[2]

Ordinance 175-91, passed by the Board of Supervisors on May 6, 1991, requires that non-potable water be used for dust control activities. Therefore, the project contractor will be

required to obtain reclaimed water from the Clean Water Program for this purpose. While non-potable water from the Clean Water Program does not meet drinking water standards, it has been determined to be safe to use for dust control purposes. The Storm Water Pollution Prevention Plan described in IV.J. Water Quality and Aquatic Ecology, pp. IV.306 - IV.311, would avoid impacts to Bay water quality if any impact might otherwise occur from the use of non-potable water on the site during construction.

OPERATIONS

Measures Under Consideration

Mitigation measures that would encourage additional transit use, such as providing ferry service directly to the ballpark, and providing CalTrain service after weekday night games, would help to reduce air pollutant emissions. Other transportation mitigation measures, such as transportation demand management programs for employees and concessionaires, could also improve project-related air emissions by reducing auto use to the site.

NOTES - Air Quality

1. Bay Area Air Quality Management District, *CEQA Guidelines; Assessing the Air Quality Impacts of Projects and Plans*, April 1996, Table 2, Feasible Control Measures for Construction Emissions of PM_{10}.

2. Bay Area Air Quality Management District, *CEQA Guidelines; Assessing the Air Quality Impacts of Projects and Plans*, April 1996, p. 13, third paragraph.

E. SEISMICITY

EMERGENCY EVACUATION PLANNING

Measure Included as Part of Project

An Evacuation Plan would be developed for the proposed ballpark for use in the event of an emergency situation which necessitated partial or complete evacuation of the facility. Such emergencies include, but are not limited to, earthquakes, explosions, and toxic spills. The Evacuation Plan would be incorporated in the employees' manual, would provide guidance for ballpark personnel to handle emergencies, and would be updated regularly. The Plan would be coordinated by trained supervisory personnel, and would be integrated with the City's Emergency Response Plans. The Plan could include such elements as division of the ballpark into clearly designated sectors, for example color-coded sectors, containing stairways, halls and directional signage painted the same color as the patron's ticket. Specific instructions for evacuating patrons from each quadrant would be outlined in the Plan. Plan components could include a command post for coordinating the emergency response; procedures for Quadrant Leaders specific to the quadrants for which they are responsible; numerous self-sufficient support stations to act as first aid, information, and message centers; emergency generators to provide power for lights, the public address system, and the Matrix Board; self-supported communication systems (two-way radios, cell-phones) to maintain contact among ballpark personnel and the City's emergency-response team (Police Department, Fire Department, Office of Emergency Services); and regular emergency-response drills to train and maintain personnel in emergency-response techniques and procedures. The Plan would address rapid access to the ballpark during emergency situations.[1]

NOTES - Seismicity

1. a) Jorge Costa, Vice President of Stadium Operations and Security, San Francisco Giants, telephone conversation, December 17, 1996.

   b) San Francisco Giants, *Guest Services Manual 1996*, Candlestick Park, San Francisco, 1996, pp. 90 - 100.

F. WATER QUALITY AND AQUATIC ECOLOGY

SHALLOW-DRAFT TUGBOATS FOR TURBIDITY MINIMIZATION

Measure Included as Part of Project

To prevent turbidity and sediment resuspension caused by tugboat activity, the project sponsor would require the construction contractor to use shallow-draft tugboats. Shallow-draft tugboats float higher in the water than deep-draft tugboats. Because they float higher, the tugboat propellers are not as deep under the water surface, and therefore are farther away from the bottom of the Channel. This arrangement has less potential to disturb bottom sediments because the local currents created by the propellers would not extend as deeply into the water column.

The project sponsor also would require the construction contractor to operate the tugboats at the minimum speed necessary to maintain maneuverability of the barges. Slower speeds would reduce the spin of tugboat propellers, thus minimizing turbidity and sediment resuspension.

MONITORING OF PACIFIC HERRING SPAWNING

Measure Included as Part of Project

As previously described, use of shallow-draft tugboats would reduce the amount of disturbance to bottom sediments and would avoid harming Pacific herring eggs. The project sponsor would additionally specify in construction contracts that if tugboat use were scheduled during the peak spawning season of December 1 to March 1 the following conditions must be fulfilled:

- A professional fisheries biologist, or other individual sufficiently competent to identify herring spawning activity, would monitor the project site daily at any time when tugboats are in use.
- In the event that the on-site biologist or qualified staff person detects herring spawning at, or within 200 meters of, tugboat berthing areas, the biologist or qualified staff person would immediately notify the Environmental Review Officer and the ballpark construction manager who would cease tugboat use for a minimum of 14 days, or until the on-site biologist determines that the hatch has been completed and larval herring have left the site. Tugboat operations may be resumed thereafter.

SILT CURTAIN FOR SUB-MARINE PILE-DRIVING AND BULKHEAD REPAIR

Measure Included as Part of Project

A silt curtain for sub-marine pile-driving activities occurring at any time of the year would be installed under water around each pilot hole location prior to drilling the holes and driving the piles. The silt curtain would contain suspended sediments within a small area. The silt curtain would remain in place throughout the pile-driving process. The curtain may be removed upon completion of pile-driving activities provided that no spawn of Pacific herring (which could occur between December 1 and March 1) has taken place on the silt curtain itself. If a spawn were to occur on the silt curtain, the curtain may not be removed for 14 days, or until it can be determined that the hatch has been completed and larval herring have left the site.

The project sponsor also would ensure that an underwater silt curtain be used to surround areas of the bulkhead that are scheduled for repair during the peak spawning season. The silt curtain would prevent Pacific herring from spawning on the hard substrates of the construction area such as the bulkhead itself or any floating platforms that may be used.

As for tugboat activities, if a silt curtain is scheduled for removal during the peak spawning season of December 1 to March 1, a professional fisheries biologist, or other qualified individual, would be present to monitor spawning activity.

DEBRIS CONTROL DURING BULKHEAD REPAIR

Measure Included as Part of Project

To prevent debris, tools, and other materials from falling into the Channel and potentially impacting Pacific herring spawning grounds and other fish and invertebrate habitat, the project sponsor would require the contractor for the bulkhead repair work to use suspended or floating platforms covered with tarps and to use catch-nets. Tarps would be replaced as necessary. Catch-nets of a sufficient gauge would be placed beyond the edges of the platforms and placed flush against the curtain wall of the bulkhead to ensure that all debris is prevented from entering the Channel.

PREVENTION OF TOXIC SPILLS FROM PIER 46B DISCHARGE PIPE

Measure Included as Part of Project

Prior to removal of the discharge pipe that connects to the closed floor drains in the Pier 46B building, the project sponsor would require the contractor for the bulkhead repair work to inspect the discharge pipe with a probe for the presence of toxic material. If material is found in the pipe, a sample would be collected and tested at a certified laboratory. If laboratory results show that the material is hazardous or toxic, the material either would be removed from the pipe before it is removed from the bulkhead, or the pipe would be plugged prior to removal, so that spills of toxic material into the Channel are prevented. Any toxic material found would be disposed of at an approved facility.

ENCLOSURE OF ZINC APPLICATION AREA

Measure Included as Part of Project

To prevent zinc particulates from entering Channel water and potentially becoming bio-accumulated in aquatic organisms, the project sponsor would specify in construction contracts that the working area for application of zinc coating to the bulkhead be enclosed to the extent feasible with impervious material to contain excess spray and over-drift.

LITTER CONTROL

Measure Not Included as Part of Project

To reduce and minimize potential choking and feeding hazards to aquatic wildlife, litter generated by waterfront areas associated with the ballpark should be prevented from entering China Basin Channel by the placement of trash receptacles, regular collection of trash, public notices, and regular skimming of the surface of China Basin Channel. Trash receptacles should be conveniently placed and widely available for public use along the Port Walk, the Lefty O'Doul and Peter Maloney Bridges, and in all of the South of Channel parking lots proposed to be dedicated for ballpark use. Receptacles should be emptied regularly and trash picked up regularly so overflows of garbage in those areas are minimized. Trash collection should occur before and after games, and as needed during non-game times. Specific maintenance staff should be assigned to perform trash collection along the Port Walk. Signs or warnings should be posted along the bridges and Port Walk to encourage users of the ballpark to dispose of litter properly. Signs or warnings should also be posted at the South of Channel parking lots.

This mitigation measure would control the amount of litter entering the Channel and Bay, but would not completely prevent this from occurring. Because litter would enter the Channel

and Bay regardless of trash collection efforts, maintenance staff and resources should be provided to skim the Channel edges east of the Lefty O'Doul Bridge and the Bay shoreline adjacent to the South of Channel parking lots at frequent and regular intervals. Because floating litter tends to drift, skimming would be needed along the entire length of the Channel, at the mouth of the Channel, and in the areas along the Bay shoreline adjacent to the South of Channel parking areas.

CAPTURE OF STORM WATER ON SOUTH OF CHANNEL PARKING AREAS

Measure Included as Part of Project

Drainage improvements for the South of Channel parking areas should be designed such that no storm water runoff would directly enter China Basin Channel or the Bay without treatment. Drainage improvements would convey collected rainwater to City sewers for treatment at the Southeast Water Pollution Control Plant. If storm water inlets are provided at the parking areas, oil/water separators should be installed at each inlet.

EROSION AND SEDIMENTATION CONTROL

Measure Included as Part of Project

*In addition to the measures identified above, the project would be subject to General Construction Activity Storm Water Permit regulations which require the preparation of a Storm Water Pollution Prevention Plan (SWPPP) to control potential erosion and sedimentation impacts (see IV.J. Water Quality and Aquatic Ecology, pp. IV.306 - IV.311). As a mandatory program, it is not identified here as mitigation; although it would serve to minimize potential project impacts.

The project sponsor would prepare and implement a Construction Storm Water Pollution Prevention Plan using at least the following Best Management Practices for controlling stormwater quality on-site.

- Schedule as much of the excavation as possible for the dry season.
- Minimize the area and length of time during which the site is cleared and graded.
- Prevent the release of construction activity pollutants such as cement, mortar, paints and solvents, fuel and lubricating oils, pesticides and herbicides.
- Install filter fences or straw bales to slow runoff and remove sediments.
- Plant grass or cover soil stockpiles with stabilizing coatings or plastic sheeting to minimize erosion.
- Install and maintain sediment and grease traps in local stormwater intakes during the construction period.
- Clean wheels and cover loads of trucks carrying excavated soils before they leave the construction site.
- Implement a hazardous material spill prevention, control and cleanup program for the construction period.

● GROUNDWATER MONITORING

Measure Included as Part of Project

As a mandatory program, groundwater monitoring is not identified here as mitigation, although it would serve to control potential project impacts. In addition to the measures identified above, the project would be subject to groundwater monitoring at well point WP-06, as required by the Regional Water Quality Control Board (RWQCB), to monitor potential migration of contaminants located near WP-06 (see IV.J. Water Quality and Aquatic Ecology, pp. IV.321 - IV.322).

Prior to initiating dewatering activities in the area near well point WP-06, the project sponsor would have a groundwater monitoring point installed between well point WP-06 and the dewatering area. Existing groundwater quality data would be collected to establish baseline conditions, and subsequent sampling would be performed frequently, with monitoring reports submitted to the RWQCB.

G. CULTURAL RESOURCES

SUBSURFACE RESOURCES

Measure Included as Part of Project

*One area with a high potential for impacts to significant subsurface cultural resources has been identified at the southeast corner of Third and King Streets. Four locations (San Francisco Gas Light Company/Citizen Gas Company; Third Street Hay Wharf; Berry Street Lumber Wharf; and Second Street Wharf) have been identified with relatively low potentials for impacts to significant resources. Nevertheless, there is some possibility that historic archaeological resources could be encountered at those locations.

Given the location and depth of excavation proposed, and the likelihood that archaeological resources would be encountered on the project site, the sponsor has agreed to retain the services of an archaeologist. The archaeologist would carry out a pre-excavation testing program to better determine the probability of finding cultural and historical remains. The testing program would use a series of mechanical, exploratory borings or trenches and/or other testing methods determined by the archaeologist to be appropriate.

If, after testing, the archaeologist determines that no further investigations or precautions are necessary to safeguard potentially significant archaeological resources, the archaeologist would submit a written report to the Environmental Review Officer (ERO), with a copy to the project sponsor. If the archaeologist determines that further investigations or precautions are necessary, he/she shall consult with the ERO and they shall jointly determine what additional procedures are necessary to minimize potential effects on archaeological resources.

These additional mitigation measures would be implemented by the project sponsor and might include a program of on-site monitoring of all site excavation, during which the archaeologist would record observations in a permanent log. The monitoring program, whether or not

there are finds of significance, would result in a written report to be submitted first and directly to the ERO, with a copy to the project sponsor. During the monitoring program, the project sponsor would designate one individual on site as his/her representative. This representative would have the authority to suspend work at the site to give the archaeologist time to investigate and evaluate archaeological resources should they be encountered.

Should evidence of cultural resources of potential significance be found during the monitoring program, the archaeologist would immediately notify the Environmental Review Officer (ERO), and the project sponsor would halt any activities which the archaeologist and the ERO jointly determine could damage such cultural resources. Ground-disturbing activities which might damage cultural resources would be suspended for a total maximum of four weeks over the course of construction.

After notifying the ERO, the archaeologist would prepare a written report to be submitted first and directly to the ERO, with a copy to the project sponsor, which would contain an assessment of the potential significance of the find and recommendations for what measure should be implemented to minimize potential effects on archaeological resources. Based on this report, the ERO would recommend specific additional mitigation measures to be implemented by the project sponsor. These additional mitigation measures might include a site security program, additional on-site investigations by the archaeologist, and/or documentation, preservation, and recovery of cultural material.

Finally, the archaeologist would prepare a report documenting the cultural resources that were discovered, an evaluation as to their significance, and a description as to how any archaeological testing, exploration and/or recovery program was conducted.

Copies of all draft reports prepared according to this mitigation measure would be sent first and directly to the ERO for review. Following approval by the ERO, copies of the final report(s) would be sent by the archaeologist directly to the President of the Landmarks Preservation Advisory Board and the California Archaeological Site Survey Northwest

Information Center. Three copies of the final archaeology report(s) shall be submitted to the Office of Environmental Review, accompanied by copies of the transmittals documenting its distribution to the President of the Landmarks Preservation Advisory Board and the California Archaeological Site Survey Northwest Information Center.

No specific locations of archaeological sensitivity are identified; however, ship and boat remains could be buried almost anywhere in the project area. Because of this sensitivity, locations where construction excavation would take place, that otherwise are not subject to archaeological investigation, would be subject to archaeological monitoring.